November 10, 1947

STEEL

The Magazine of Metalworking and Metalproducing

ESTABLISHED 1882

EDITORIAL INDEX, PAGE 17

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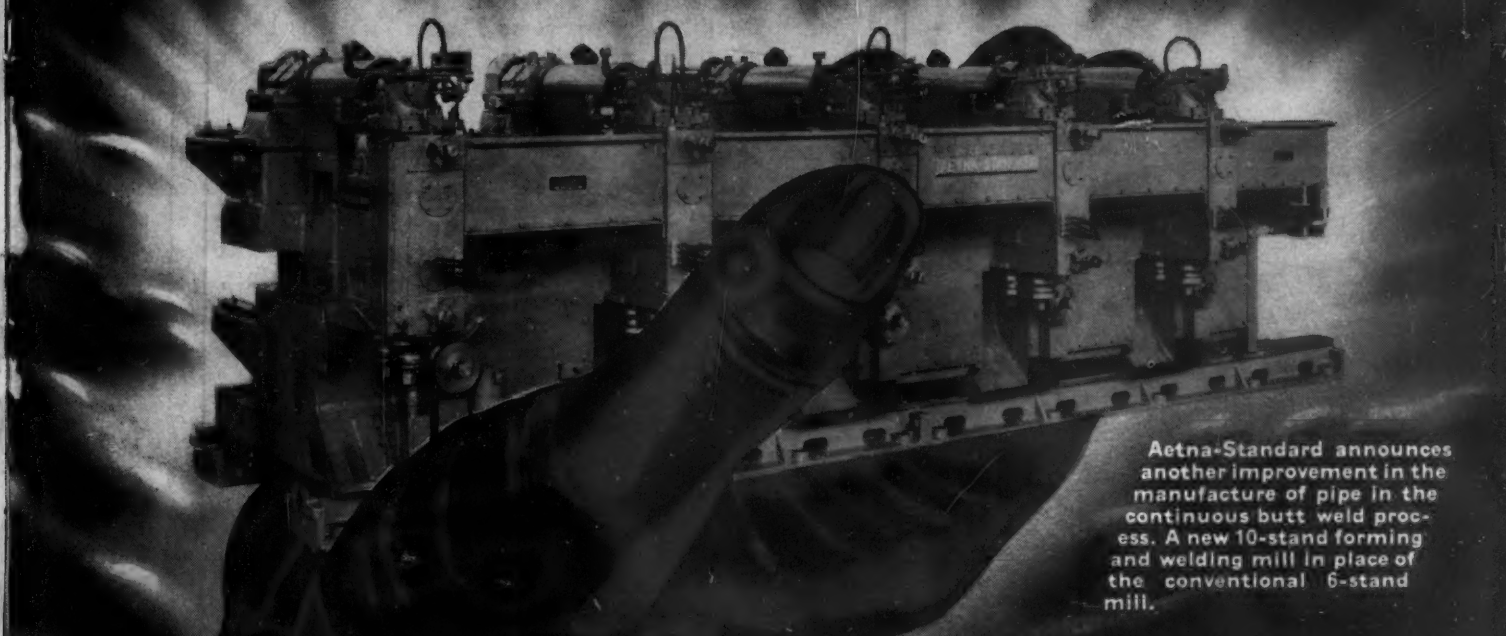
DETROIT

NEWEST DEVELOPMENT IN CONTINUOUS BUTT WELD PIPE



Aetna-Standard announces another improvement in the manufacture of pipe in the continuous butt weld process. A new 10-stand forming and welding mill in place of the conventional 6-stand mill.

The 10-stand mill produces three distinct production and cost advantages:

1. ***Much greater output.*** Production will be as much as 50% greater on some sizes of pipe than with mills now in use. The reason—wider skelp, greater reduction and elongation.

2. ***Higher furnace efficiency.*** Use of wider skelp for the small sizes of pipe utilizes furnace capacity to better advantage. Speed through furnace need not be increased to increase production.

3. ***Better quality.*** It has been proven that the more work done in reducing increases quality of weld.

DESIGNERS AND BUILDERS to the Steel, Non-Ferrous and Chemical Industries

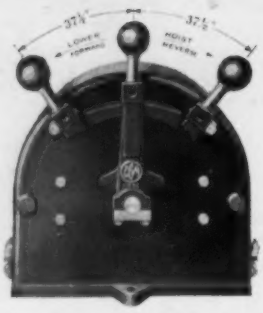
THE AETNA-STANDARD ENGINEERING COMPANY - YOUNGSTOWN, OHIO

ASSOCIATED COMPANY: HEAD WRIGHTSON & COMPANY, LTD., MIDDLESBROUGH, ENGLAND

CAM MASTER SWITCH

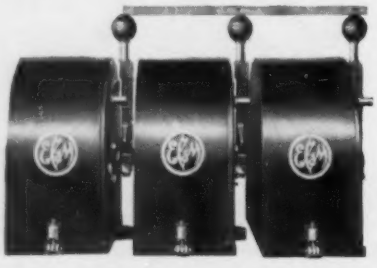
★ *Gives Improved Performance where SPEED-CONTROL is desired . . . .*

The EC&M Cam Master Switch is used by many plants to obtain speed-control of crane and mill-auxiliary drives and similar applications where magnetic control is employed.



Short throw saves motion of operator's arms—reduces fatigue.

Standard 6-point, 12-circuit Master Switch.



Narrow width gives short-center mounting—keeps handles within easy reach of operator where several Master Switches are controlled by one operator.

Cover forms one side of enclosure and, when removed, makes all parts accessible.

For this service, these Master Switches have outstanding advantages, the more important being—

Easy on the Operator

1. Handle on 6-point Master travels only 37½° from off-position to full on position in either direction. Throw is 6° less for each speed-point reduced—31½° for 5-points, 25½° for 4-points, etc.
2. Narrow width allows close grouping of operating handles where one operator has more than one Master Switch to manipulate—12-circuit Masters mount on 9-inch centers, 8-circuit on 7⅞-inch centers and 16-circuit on 10⅛-inch centers.
3. Roller-arm centering-device gives definite feel to all points—off-position is most prominent, yet is so shaped to permit easy inching operations between off and first points in either direction.

Convenient to Wire

1. L-shaped frame allows maximum accessibility to all parts when cover is removed.
2. Generous room for pulling in wires and making connections to terminal studs, which are equipped with cup washers and locking nuts.
3. Tapped conduit hole in middle of base brings leads in at bottom close to studs.

Specify EC&M Bulletin 1190 Cam Master Switches for cranes, and mill auxiliaries, ore bridges, and similar applications.

THE ELECTRIC CONTROLLER & MANUFACTURING CO.

2698 EAST 79th STREET CLEVELAND 4, OHIO

BETHADUR AND BETHALON

Free-Machining

STAINLESS

Bars Billets

BAR SECTIONS AND FINISHES

ROUND	SQUARE	FLAT	HEXAGON	OCTAGON
Hot-rolled; Forged	Hot-rolled	Hot-rolled	Hot-rolled	Hot-rolled
Cold-drawn	Forged	Forged	Forged	Forged
Centerless-ground	Cold-drawn	Cold-drawn	Cold-drawn	Cold-drawn
Rough-turned; Polished				

Thinking about stainless? Consult Bethlehem. Here's why—

1. Our engineers will help you select the most suitable grade of stainless steel for the job . . . assist with any problems in processing, forging, heat-treating, machining.

2. Bethlehem stainless steels—Bethadur and the free-machining Bethalon grades—cover the entire range of standard AISI stainless steels, as well as many non-standard analyses.

3. These stainless steels are produced by an organization that has been making stainless for 30 years.

★ BETHLEHEM STEEL ★

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation
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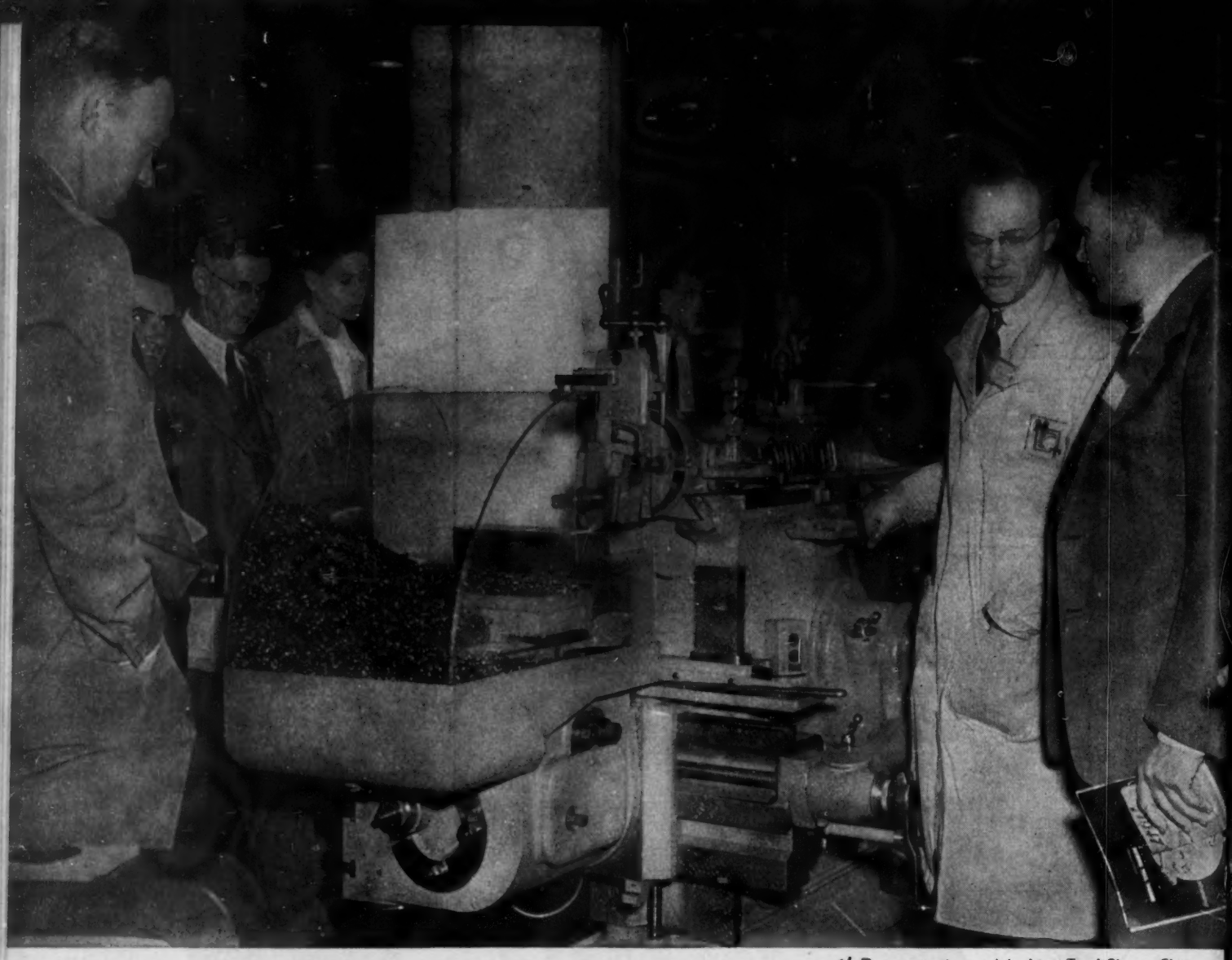


*Demonstration at Machine Tool Show, Chicago.

CARBIDES PAY ... with the CINCINNATI TOOL LIFTER ...on CINCINNATI SHAPERS

The rigidity that dampens vibration; the power for the toughest steels; the speed for thrifty carbide performance—all are found in Cincinnati Heavy Duty Shapers.

Whether it's alloy steels, chilled castings, chipper blades, or glass molds—carbides on Cincinnati Heavy Duty Shapers are cutting manufacturing costs.

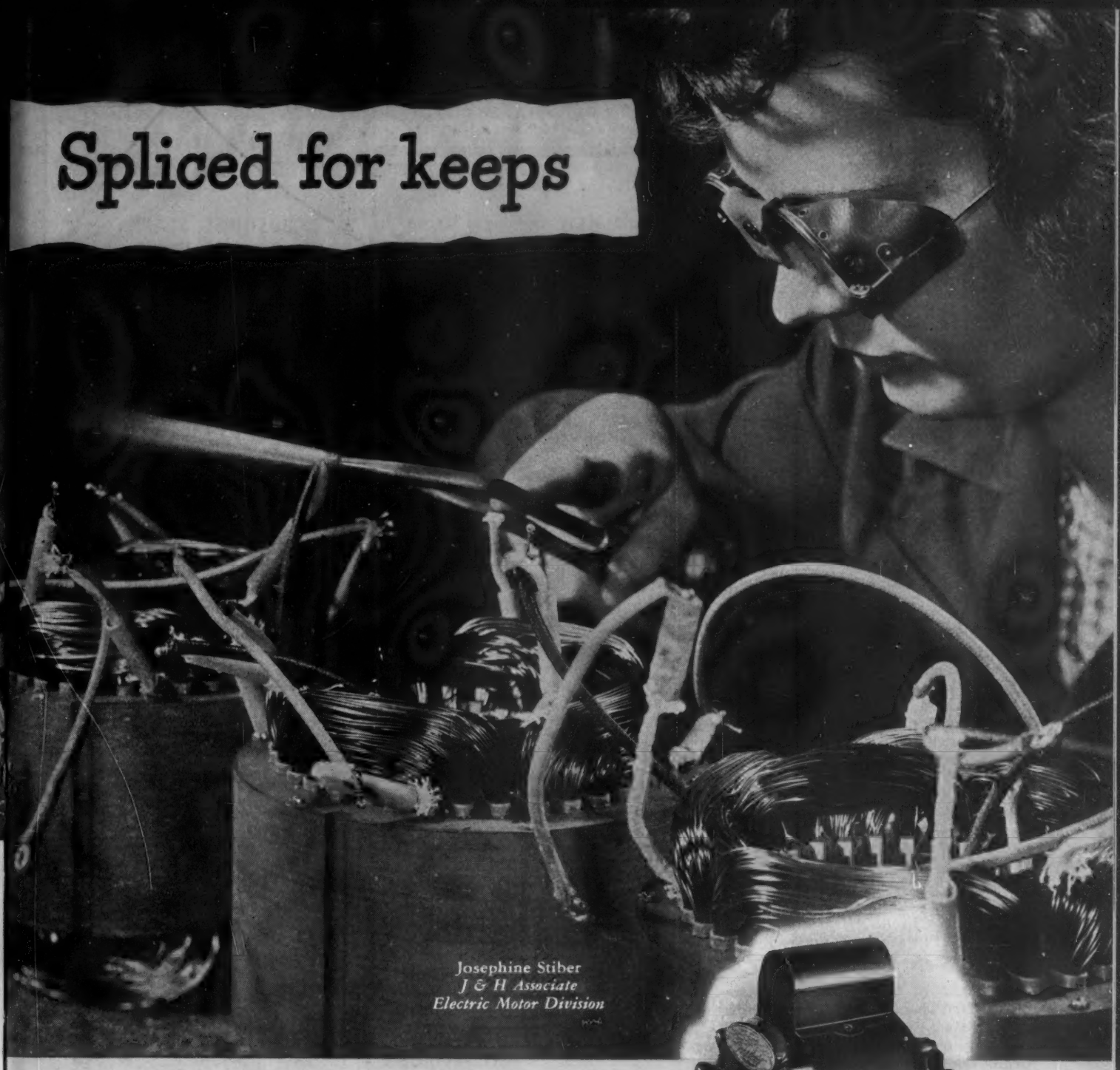
*This Cincinnati Shaper, equipped with a Cincinnati Tool Lifter and carbide tools, operated steadily at 200 strokes a minute at the Machine Tool Show in Chicago. During this ten-day demonstration the shaper was producing a superior finish—quickly and efficiently—on Heppenstall grade B die blocks.

THE CINCINNATI SHAPER CO.

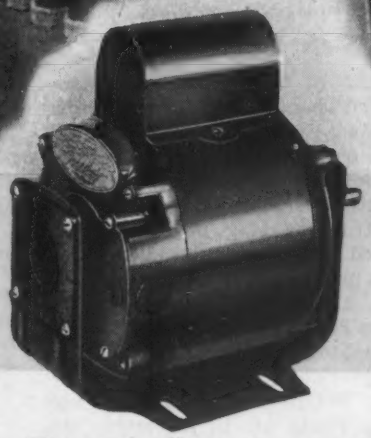
CINCINNATI 25, OHIO U.S.A.

SHAPERS · SHEARS · BRAKES

Spliced for keeps



Josephine Stiber
J & H Associate
Electric Motor Division



Welding is the *positive* way to splice coil ends—there's little chance for a loose connection in Jack & Heintz electric motors because the joints are *permanent* and *clean*, devoid of flux acid which often spatters when coils are soldered.

Methods like this build into Jack & Heintz motors the *extra* years of service expected of a quality product.

Better electric motors through

JACK & HEINTZ

Mass Precision

JACK & HEINTZ PRECISION INDUSTRIES, INC., *Cleveland 1, Ohio*

Behind the Scenes...

About Old Lists

Funny thing about humans is their resistance to change. Another funny thing is the tremendous amount of change that takes place in spite of all resistance. The genesis of this profound thought is the mail that we still receive around this printshop addressed to *Iron Trade Review*. That publication, one of America's leading business papers, has been called STEEL for some 18 years now. There are still a few mailing lists carrying the old name, and we can't help wondering who else might be on those lists. Most mailing lists get out of date at the rate of about 10% per year, and after 18 years there would be doggone few people left on any mailing list.

Work for the Left Foot

Since the advent of all these automatic transmissions in automobiles, the left foot is being left more and more with nothing to do. We have been wondering for some time why the right foot has to do all the work, with nothing but a big blank space over there for the southern brother. So now comes a Chicagoan with the most simple of answers—an accelerator to install on the left side, so all two-footed drivers can use both feet. We're reaching that ultimate goal of auto builders, where you push one foot to go and the other to stop, with nothing else to do but steer.

How It Gets Around

Channels of information are shadowy, hard-to-understand things. How people find out about things often is a deep mystery, just like the jungle drum telegraph system which sends complicated messages across miles of the tropics using only a simple drum beat. Some of our mail is just about as uncomprehensible. Like, for example, the letter we received the other day from a gentleman in Washington asking for a sample of our match covers. As far as we know, nobody in Washington has seen our matches, made up to advertise the fact that "what STEEL says makes news". They were distributed at the Machine Tool Show and the Metal Show in Chicago—and by what devious channels this Washington match collector located them we'll probably never know. All we know is that he has seen them and wants a copy for his collection—which we have sent, incidentally. Sometimes we get the same feeling about the news beats that our editors are continually publishing on Monday mornings. Scoops, they say, are almost never the result of luck. They usually come only after days, weeks and even months of digging to uncover the news. To us there is still an aura of mystery around some of this business, though. We asked one of the editors where he happened to pick up a particular story, and he just said, "Oh, some guy in an office in Chicago told me about that." What we can't figure out, although it seems commonplace to them, is just how they know to be in that particular office at that particular time so the particular man will mention the particular subject. Sounds a little bit like the monkey-and-piano story to us, proving that anything can be done if you only wait for the law of averages to get around to it.

No Name Blues

We have a small mystery on our hands, from an anonymous correspondent. There are a large number of such people, who delight in writing anonymous letters to editors, either making snide remarks about the publication, or trying to be funny, or else just plain being cryptic about the whole thing. The most recent of these involves an article published a couple of weeks ago about the use of stainless steel in the dairy industry. This came back to us with a big "POLIO" scrawled across it. We've been wondering since whether the sender was the victim of a fixation, if he thinks stainless steel in the dairy industry is a polio-minimizer (which it well might be) or if he thinks maybe the polio bug particularly likes to see its own reflection in the gleaming stainless of a milk plant and heads for same.

More Puzzles, Less Beer

One of our good readers registers a complaint about this column. That's not unusual. There are lots of complaints about this spot, most of them from us when we're trying to find something to fill up that last two inches in the second column at about 15 minutes before press time. This one, however, is different. Seems that the puzzles we've been running interfere with more pleasant pursuits, such as knocking the foam off another one down at Joe's. We aren't too worried about that, though, because it makes us feel that in a small way we're contributing to the campaign to save wheat.

Shrdlu

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STEEL

Vol. 121—No. 19 November 10, 1947

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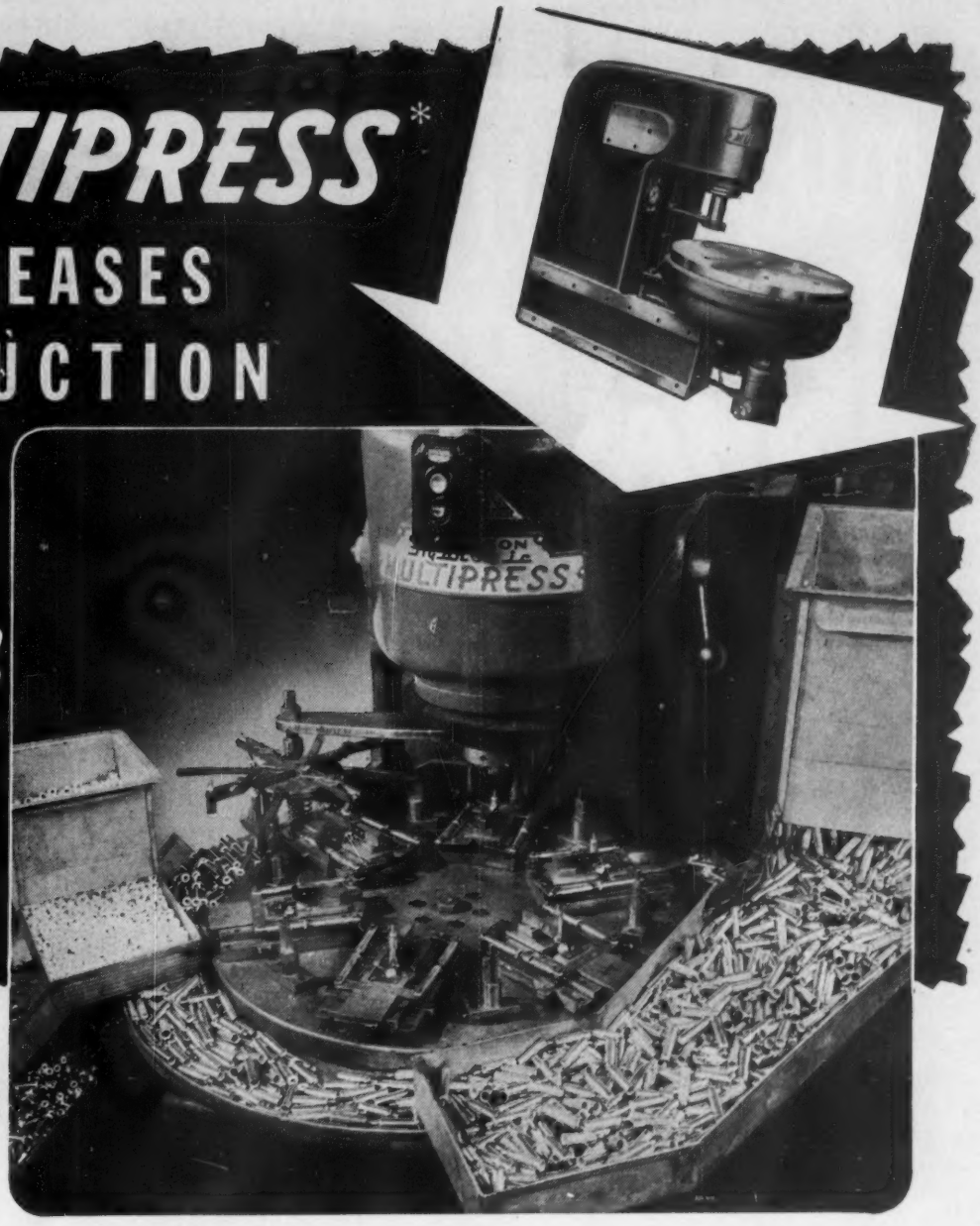
Editorial Staff on Contents Page

MULTIPRESS* INCREASES PRODUCTION Over 100% for Electrical Products Manufacturer



Precision crimping of a thin metal tube to a ceramic bushing presented quite a production problem to a large west coast electrical products manufacturer. Due to variance in part dimensions and part fragility, the operation was formerly run on a manual type press, depending on operator skill for correct pressure. Production by this method was 500 pieces per hour, with a high percentage of rejects. By the MULTIPRESS method, feeding, positioning and ejection of parts is completely automatic, requiring the operator only for loading. *Production was upped to 1100 pieces per hour and rejects greatly reduced—using an unskilled worker!*

*T. M. Reg .U. S. Pat. Off.

DENISON EQUIPMENT for APPLIED HydrOILics

The Denison HydrOILic Index Table was one of the standard accessories used with the MULTIPRESS in achieving this unusual production record. This accessory is especially designed for rapid feeding of parts to the MULTIPRESS ram, for peak production on small and medium sized parts. Since the exact pre-set pressure of the MULTIPRESS remains constant, regardless of part variations, high production can be maintained *without rejects!*

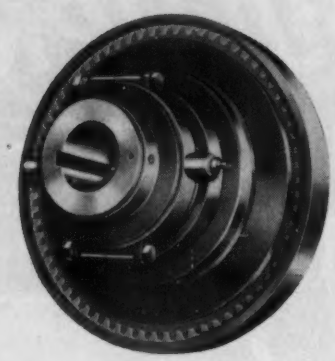
MULTIPRESS used with the Index Table has been boosting production in all industries, often to figures once thought impossible to attain. After you investigate MULTIPRESS with HydrOILic Index Table, you'll see how your own production figures may well do the same! Write today for complete data!

THE DENISON ENGINEERING COMPANY

1163 Dublin Road • Columbus 16, Ohio

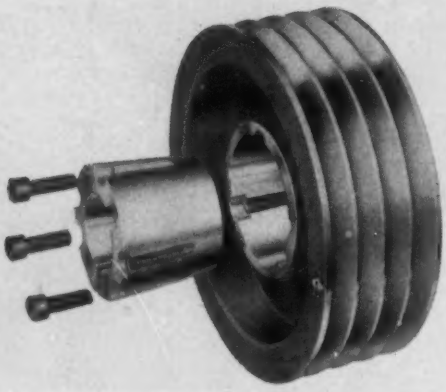
This is the BRONZOIL Bearing. Developed by Dodge for fan and blower service. A new and better transmission appliance.

U. S. Patent No. 1,931,055



This is the ROLLING GRIP Clutch. Developed by Dodge. No toggles. A new and better transmission appliance.

U. S. Patent No. 2,397,414



This is the TAPER-LOCK Sheave. Developed by Dodge. No flange. No collar. A new and better transmission appliance.

U. S. Patent No. 2,402,743

This is the Dodge Transmissioneer – who will tell you about new ways of transmitting power mechanically.

DODGE

of Mishawaka, Ind.

New equipment which helps cut costs, improve machine performance, increase production is offered to you by Dodge of Mishawaka. For detailed information about power transmission units to meet specific needs in your plant, or on your product, call the Transmissioneer, your local Dodge distributor. Look for his name in the classified telephone directory under "Power Transmission Equipment." A talk with him will prove profitable to you.

DODGE MANUFACTURING CORP., MISHAWAKA, IND.

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NAME PLATES

FOR YOUR NAME PLATE REQUIREMENTS, WRITE OUR SUBSIDIARY, ETCHING COMPANY OF AMERICA, 1520 MONTANA STREET, CHICAGO 14, ILLINOIS

an All 'Round INDUSTRIAL CRANE

does things no other type of MATERIAL HANDLING EQUIPMENT CAN DO!

THINK it over — what other type of equipment can you buy that will do what a Northwest Crawler Crane can do? It's not a one area machine like a locomotive crane (confined to tracks) or like overhead equipment. With your Crawler Crane you have the answer to practically every material handling problem that can occur about a plant.

It handles raw material in the stock yard . . . it will handle coal and ashes at the power plant . . . it will handle the finished product on the loading dock . . . it piles high or low . . . it will reach overhead windows, platforms and doors . . . it will handle practically any type of material from boxed and crated goods to loose materials and is built in a range of sizes fron 4 to 44 ton capacity.

Now is the time to plan ahead to modernize your store yard facilities. We will be glad to tell you what a Northwest can do and take your order for future delivery.

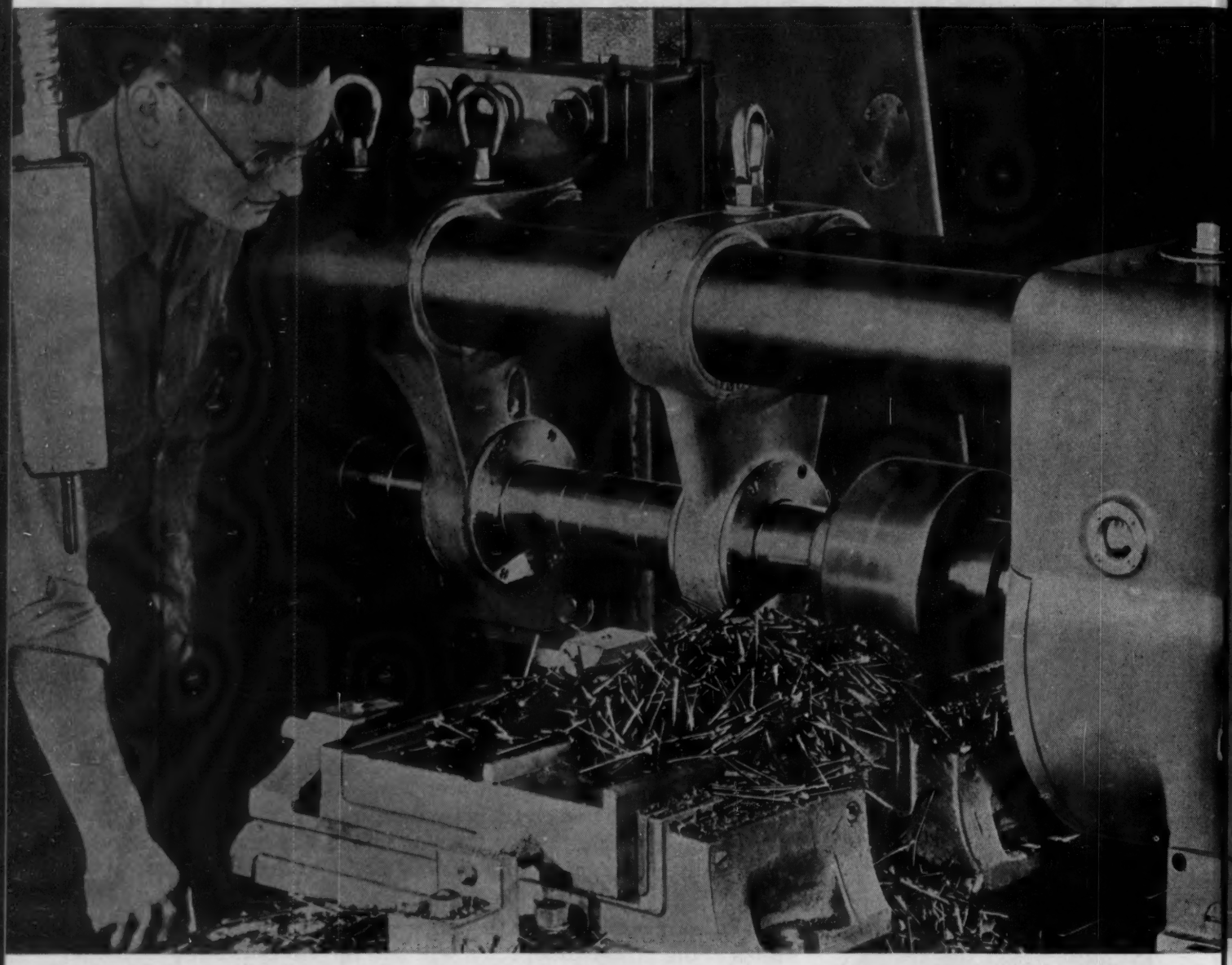
NORTHWEST ENGINEERING COMPANY
1508 Field Bldg., 135 South LaSalle St.
Chicago 3, Illinois

NORTHWEST

The Crane that goes Anywhere!

4 to 44 tons

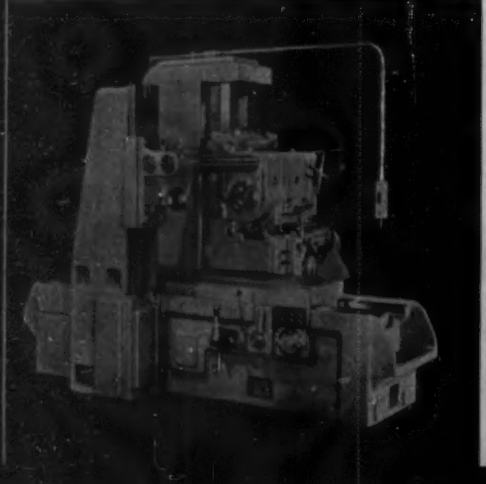
PUTS BIG BITE ON

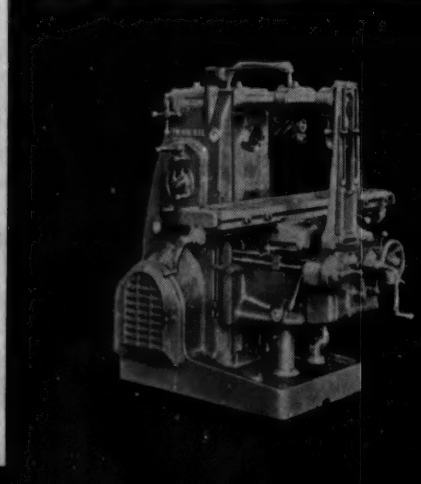


NEW SIMPLEX BED-TYPE MILLING MACHINE — Kearney & Trecker's new concept of bed-type design. Gives you wide working ranges and horse-power capacities for most effective use of all cutting tools.

MODEL 3K VERTICAL AUTOMATIC CYCLE MILLING MACHINE — New Automatic Cycle feature gives you high production capacity on long run lots — and amazing new ease of control for short runs.

MODEL 2H PLAIN MILLING MACHINE — The most popular size machine ever built. Available in Plain, Universal and Vertical types. Automatic Cycle feature obtainable on either Plain or Vertical types.





METAL & COSTS!

High power, cost-cutting Kearney & Trecker-Milwaukee Milling Machines help Industry produce more for less.

SEE that job at the left? See that pile of chips? That's a big new design of Simplex Bed Type Milling Machine knifing a carbide cutter through hard steel at a record rate.

But that's only a small hint of what Kearney & Trecker machines can do for you. There's a Kearney & Trecker machine for every milling job — in small shops, high production plants or precision tool rooms. There's a Kearney & Trecker in every standard size and type with horsepowers from 3 to 50 with working ranges to suit. Think of it! Over 250 different models, sizes and types to choose from — to select the right machine for your job!

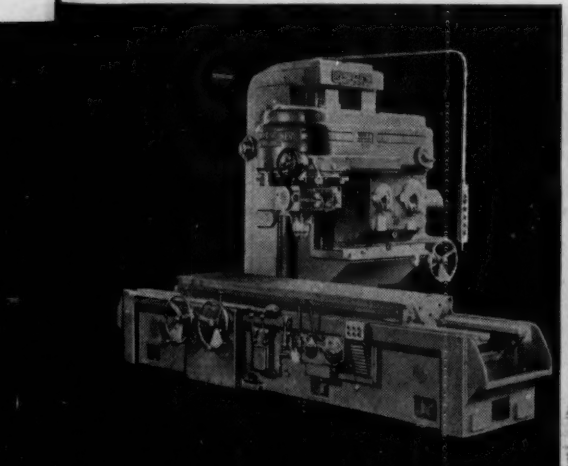
And don't overlook Kearney & Trecker's Model 2D and new 5D Rotary Head Milling Machines — miracle machines that produce any geometric shape in both horizontal and vertical planes direct from the blueprint — no models or templets needed! For precision boring — there's the Models B and C Autometrics. Machines that give you accuracy to the closest standards ever set at Kearney & Trecker.

Investigate Kearney & Trecker-Milwaukee Machine Tools! Ask how they can help you make a better product at lower costs to you.

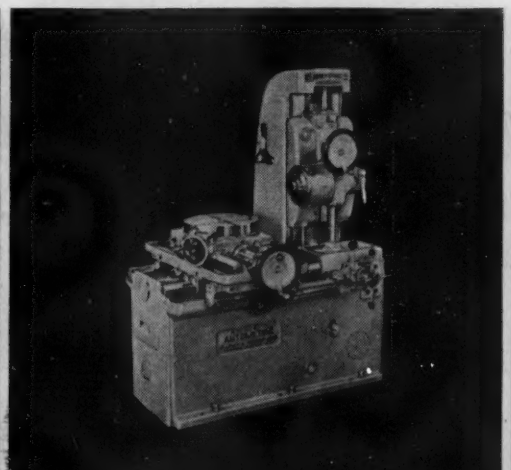
KEARNEY & TRECKER
CORPORATION
Milwaukee 14, Wisconsin

KEARNEY & TRECKER
MILWAUKEE
MACHINE TOOLS

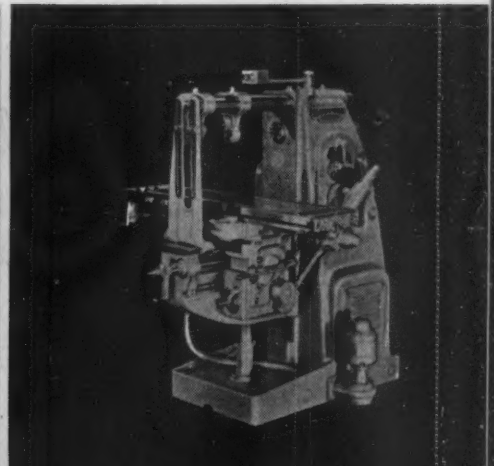
MODEL 5D ROTARY HEAD MILLING MACHINE — A miracle of big machine design. Produces any geometric shape in horizontal or vertical planes direct from blueprint — no models or templets!



MODEL B AUTOMETRIC BORING MACHINE — A precision product for extra-precise results. Rotary table permits work on several sides of workpiece in one set-up — big help in accuracy and economy.



MODEL E PLAIN MILLING MACHINE — New simplified design gives you every fundamental requirement for foreign or domestic use — plus highest dollar for dollar value obtainable anywhere.



UNITED STATES

customers
that are hard to please!

Why? **For the simple reason that they generally know exactly what they want—and appreciate it when they get it.**

IN this business of supplying alloy steel to industry, you have to take the bitter with the sweet. The "sweet" jobs—that go through the mill like duck soup, that any steel producer can handle with his hands tied—are nice to get, and we welcome them. But we don't side-step the other kind—the "bitter" jobs that really put a steelmaker on his mettle.

For when it comes to meeting out-of-the-ordinary alloy steel problems and requirements that demand special handling from A to Z—that require the utmost effort from both metallurgists and mill personnel—that just can't be done without exceptional knowledge and experience all along the line—we *know* we can please the customer.

We've done it in hundreds—yes, thousands—of cases, on jobs that other steelmakers were glad to pass up. And we've found out something that makes us particularly fond of "tough" customers. We discovered that the tougher the job put up to us, the better friends we made when we delivered the goods.

So, if you've got a "bitter" job that's been bothering you, bring it in. We'll try and sweeten it up for you.

CARNEGIE-ILLINOIS STEEL CORPORATION

Pittsburgh and Chicago

Columbia Steel Company, San Francisco, *Pacific Coast Distributors*
Tennessee Coal, Iron & Railroad Company, Birmingham, *Southern Distributors*
United States Steel Export Company, New York

7-980

Did you know?

. . . That no other single alloy steel producer can equal Carnegie-Illinois as regards versatility of equipment and facilities for production for all forms of alloy steels.

. . . That Carnegie-Illinois developed U·S·S Improved Heat Treating which provides greater uniformity in heat treatment and insures improved physical properties in the heat-treated condition.

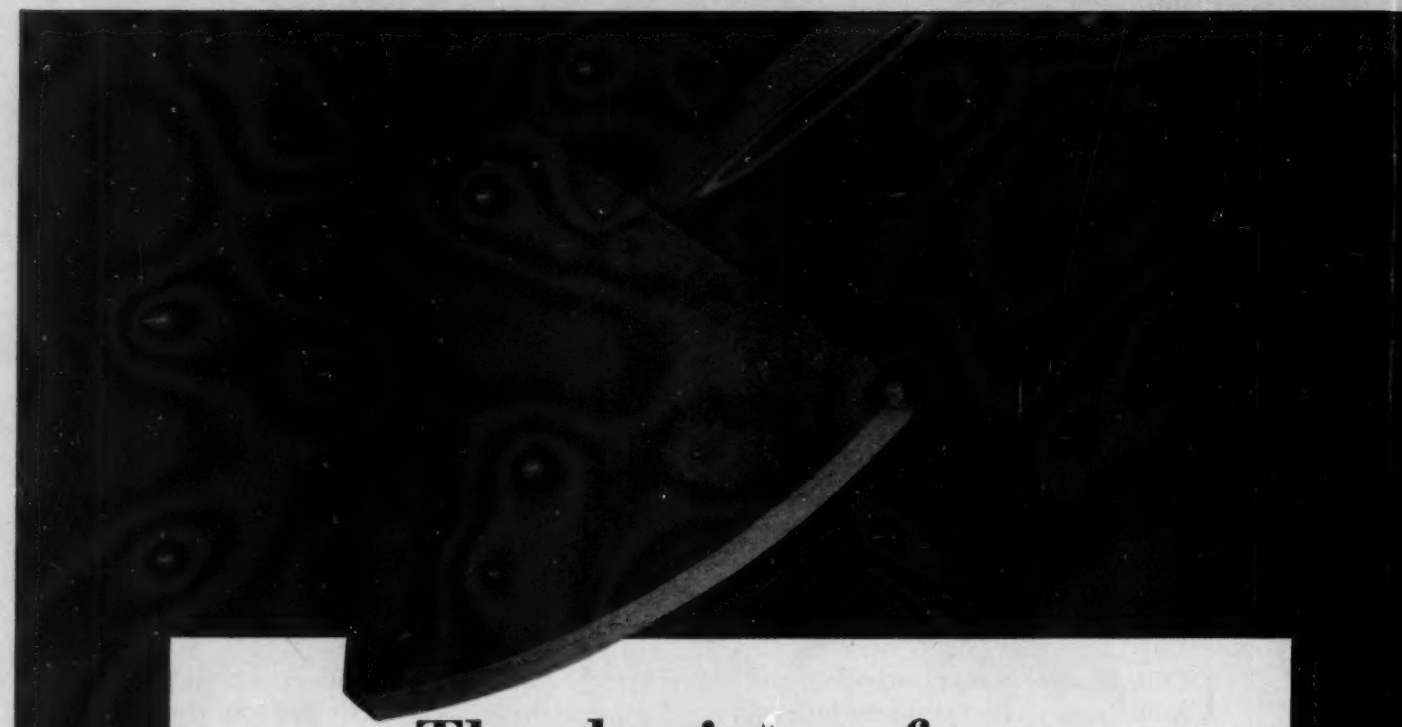
. . . That Carnegie-Illinois is now producing new, improved carburizing steels for heavy-duty applications—U·S·S Super-Kore—which while costing less than higher alloyed carburizing steels show equal or greater hardenability and are easier to anneal, possess better machinability, and lower your manufacturing costs.

U·S·S Carilloy Steels

USS STEEL — UNITED STATES STEEL

ELECTRIC FURNACE OR OPEN HEARTH

COMPLETE PRODUCTION FACILITIES IN CHICAGO AND PITTSBURGH



Thanksgiving feast for your cost department

Would you like to invite your cost department to a feast of extra profits every day?

Maybe a careful look into your grinding operations will lead to reduced production expenses . . . savings that would make your cost men give thanks over and over again for the many dollars saved.

You'll be missing a good thing if you fail to consider this proposal: Let Peninsular Engineers give your grinding a complete study.

They will investigate your grinding from every angle—your equipment, the materials you grind and all other factors that influence grinding costs. From results learned, they will offer you a job-designed grinding program that may mean appreciable savings for you.

Since 1889, Peninsular Engineers have specialized in solving grinding problems. We believe they can render a valuable service for your grinding, too.

The Peninsular Grinding Wheel Co., 729 Meldrum Ave., Detroit 7. *Sales Offices:* Chicago, Philadelphia, Boston, Buffalo, Cleveland, Pittsburgh, Houston, St. Louis, Cincinnati.

PENINSULAR

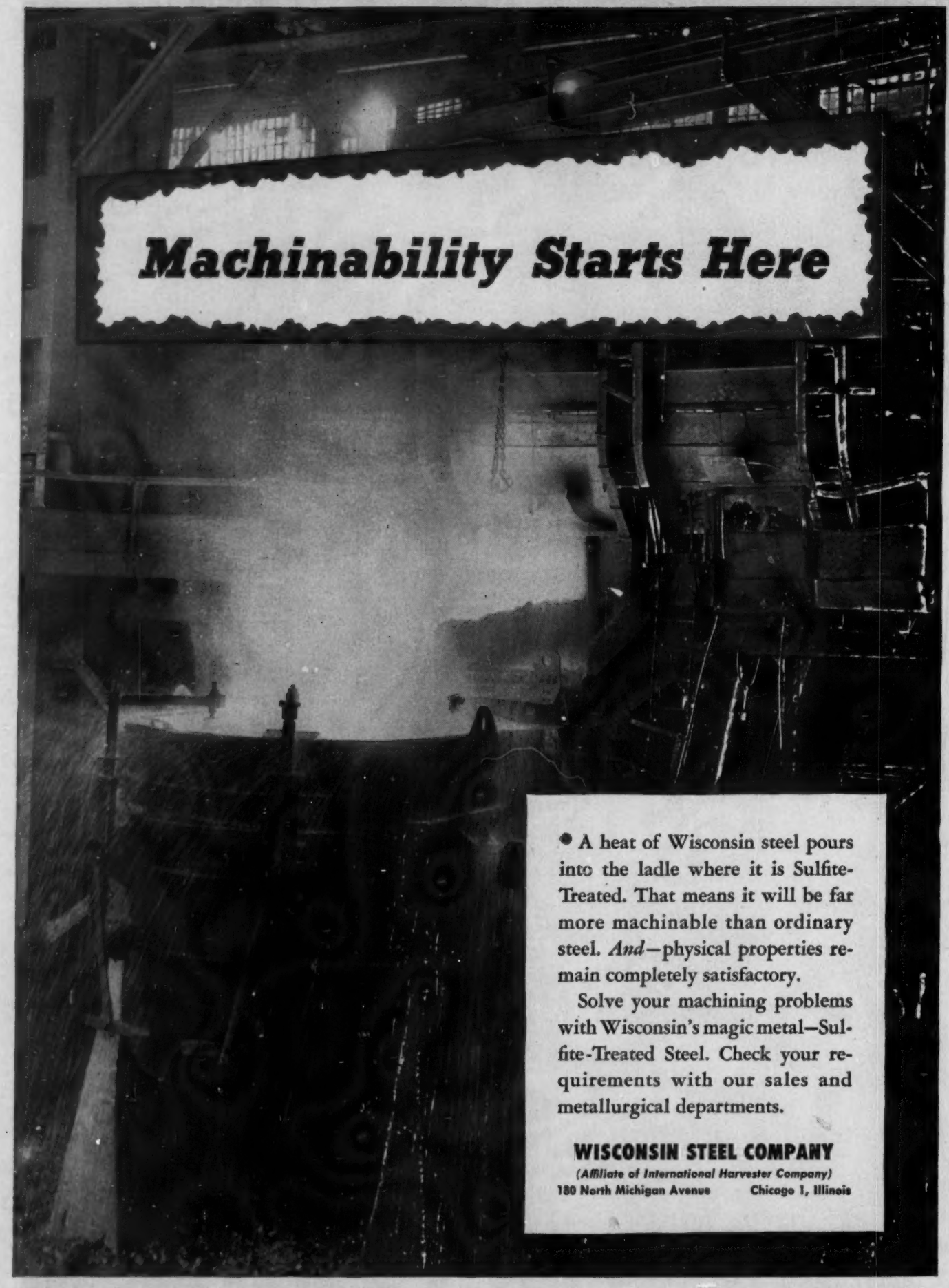
INDIVIDUALLY PENINSULAR ENGINEERED

GRINDING WHEELS

SINCE 1889

SPECIALISTS IN RESINOID & VITRIFIED BONDED WHEELS

Head and body of this Peninsular turkey are stand grinding wheels; his tail feathers are a segment of a disc grinding wheel, and legs and wattles are special wheels for shoulder grinding.


Machinability Starts Here
• A heat of Wisconsin steel pours into the ladle where it is Sulfite-Treated. That means it will be far more machinable than ordinary steel. *And*—physical properties remain completely satisfactory.
Solve your machining problems with Wisconsin's magic metal—Sulfite-Treated Steel. Check your requirements with our sales and metallurgical departments.
WISCONSIN STEEL COMPANY
(Affiliate of International Harvester Company)
180 North Michigan Avenue Chicago 1, Illinois

WISCONSIN SULFITE-TREATED STEEL

UNION PACIFIC

TREASURE MAP OF INDUSTRY

Montana*

WEALTH OF MINERAL DEPOSITS
IMMENSE COAL RESERVES
LARGE LUMBER PRODUCTION
AVAILABLE WATER POWER
ABUNDANT LIVESTOCK
VALUABLE WOOL CLIP
VARIED AGRICULTURE
TREMENDOUS WHEAT YIELD
SCENIC BEAUTY

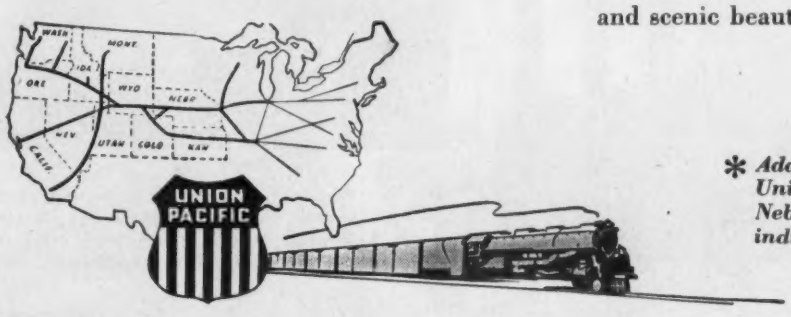
* *One of a series of advertisements based on industrial opportunities in the states served by the Union Pacific Railroad.*

Known as the "Treasure State," Montana is richly endowed with raw materials essential to industrial production. Among the many metallic minerals are silver, copper, lead, manganese, chromium and molybdenum. Coal reserves have been estimated at over 400 billion tons. The majority of the state's cities are supplied with natural gas.

Montana is a top producer of cattle and sheep, the annual sheep production being approximately two million head with a wool clip of great value. In agriculture, wheat takes first rank among grains. Sugar beets, potatoes, together with other vegetables, are grown on its farms. There are many thousand acres of forests, principally pine.

The Union Pacific Railroad serves Butte in the heart of the great mining area, and West Yellowstone—most popular rail entrance to the famous Yellowstone National Park.

Montana welcomes new industry. It has the space, materials, facilities and manpower to encourage firms seeking new locations. Additional advantages are good living conditions, an excellent educational system and scenic beauty.



* *Address Industrial Department, Union Pacific Railroad, Omaha 2, Nebr., for information regarding industrial sites.*

UNION PACIFIC RAILROAD

THE STRATEGIC MIDDLE ROUTE

UNITED STATES RUBBER COMPANY

SERVING THROUGH SCIENCE

With a Lift of Her Finger... She Raises Pressure by the Ton!

U. S. Royalite Grinding Wheel Sample being tested with this specially-designed machine in a U. S. Rubber Company laboratory.

Here, on a specially-designed machine, "U. S." engineers have taken a grinding wheel sample and just tested it to destruction!

But before this grinding wheel reached the breaking point, it had proved its ability not only to meet, but to *surpass*, the strict specifications demanded by the customer's job.

Thorough testing in "U. S." research laboratories is one of the reasons why U. S. Royalite Grinding Wheels are so much in demand, testing that covers not only abrasives and bonds of every kind, but also the related fields covered by all the products of United States Rubber Company.

Then there's the test of time. Experience built up in the course of 84 years enables "U. S." to solve current wheel problems of every type—and to anticipate future problems brought on by higher production quotas and new manufacturing techniques.

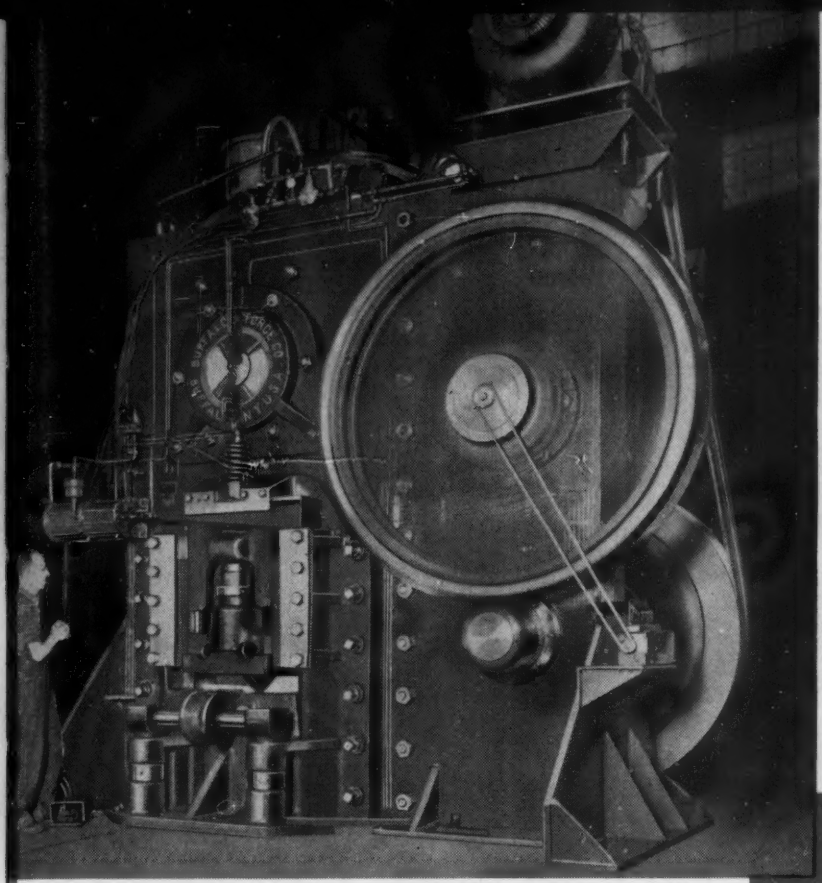
As a result, whether you're snagging castings, grinding ball races or working with billets, bits, slabs or sauce pans, you'll find a U. S. Royalite Wheel carefully *engineered to your job*. In addition, "U. S." field engineers, by thorough testing right in your own plant, can give you accurate grinding wheel costs *in advance*.

For complete information, write to Mechanical Goods Division, United States Rubber Company, 1230 Avenue of the Americas, New York 20, N. Y.

When this midwestern iron foundry adopted high speed snagging 17 years ago, it picked U. S. Royalite Wheels. It has been using them ever since on the basis of their superior performance.

U. S. ROYALITE GRINDING WHEELS

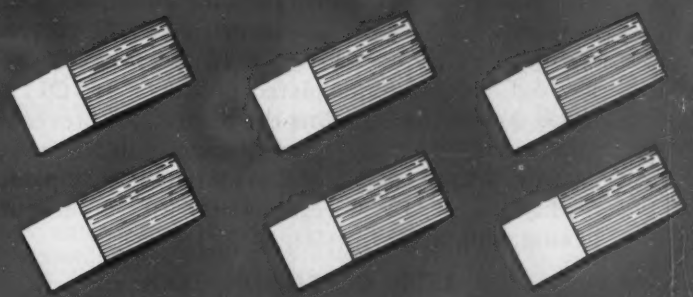
ENGINEERED TO YOUR JOB



Slicing Costs Too—

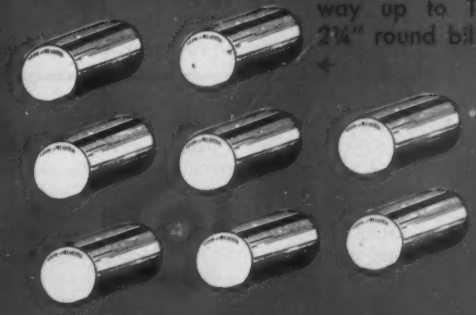
as "Buffalo"

BILLET SHEARS CUT



—SIX 9" square billets a minute! EIGHT 8" billets! TEN 7" billets! And all the way up to THIRTY 2" billets!

—SIX 10" round billets a minute! EIGHT 9" billets! TEN 7¾" billets! And all the way up to THIRTY 2¼" round billets!



If you cut billets for forging, you will find "Buffalo" Billet Shears amazing cost-cutters. They cut more billets per minute—they cut cleanly and uniformly, with no "smearing" or notching. And "Buffalo" builds these shears in 11 capacities to handle the sizes you require—in 24-hour-a-day production, hot or cold slabs.

"Buffalo" Billet Shears can handle your flat, angle or channel cutting, in an equally wide range of capacities.

The speed, accuracy and rugged durability of "Buffalo" Shears actually SLICE YOUR COSTS. Why not write us now for engineering data?

BUFFALO FORGE COMPANY

158 Mortimer St. -:- Buffalo, N. Y.

Canadian Blower & Forge Co., Ltd., Kitchener, Ont.

SEND NOW *for Bulletin No. 3295-A, which gives all facts on faster shearing with "Buffalo" Billet Shears.*

"Buffalo"

BILLET SHEARS

No Flaking - No Chipping - No Peeling

when you use Anti-Corrosive IRIDITE as a Paint Base

Tests by several leading companies show that IRIDITE provides a firm base for paint and clear lacquer . . . as well as a corrosion-licking, protective finish . . . on zinc die cast, zinc plated, galvanized and cadmium plated products. IRIDITE keeps the zinc from fouling the paint . . . prevents formation of the soapy, chalky underlying film that destroys adhesion. IRIDITED products take paint readily . . . hold it permanently . . . without flaking, chipping or peeling!

LICKS CORROSION, TOO!

Moreover, IRIDITE is widely used as a final protective finish . . . on zinc, cadmium, galvanizing. A quick IRIDITE dip balks corrosion while adding eye-appeal to your products . . . since it is available in black, green, bronze, olive and transparent IRIDITE bright. And to cut costs, use IRIDITE in combination with zinc plating to replace more expensive materials.

FAST APPLICATION!

Whether you use IRIDITE as a paint base or as a anti-corrosion finish . . . it's easy to apply. Simply immerse your product in an IRIDITE solution . . . manually or automatically . . . on racks or in bulk . . . for 15 to 60 seconds . . . at normal shop temperatures. Your products keep moving along at automatic production line speed . . . and they are dried in a few seconds for immediate painting or handling.

Test IRIDITE as a paint base in your own plant, under your own conditions. Check it as a final protective finish with our FREE TEST PANEL . . . half IRIDITED, half unprotected. Send for your panel today. Allied Research Products, Inc., 4004 E. Monument Street, Baltimore 5, Md.

IRIDITE TEST-imonials

"We have nothing but satisfactory reports on the parts that were Iridite treated on our two body valves."

EDWARD B. LOCKWOOD, *Vice President*
Streamaster Shower Corporation
New York, N. Y.

See how IRIDITE fits into your production. Send for FREE TEST PANEL . . . and subject it to the same corroding conditions your products must meet. Write today.

DISTRIBUTORS: WESTERN MICHIGAN—J. C. Miller Co., Grand Rapids, Mich.; EASTERN MICHIGAN—Wagner Bros., Detroit, Mich.; MINNESOTA & WESTERN WISCONSIN—Industrial Chemical & Equipment Co., Minneapolis, Minn.; ST. LOUIS & CENTRAL SOUTHWEST—La Salco Inc., St. Louis, Mo.; CHICAGO, EASTERN WISC. & IOWA—Allied Research Prod., Inc., Chicago, Ill.; OHIO & INDIANA—J. C. Baker, Cleveland, Ohio; NEW YORK & NEW ENGLAND—Mitchell Bradford Chemical Co., Bridgeport, Conn.; PENNSYLVANIA & NEW JERSEY—MacDermid Inc., Waterbury, Conn.

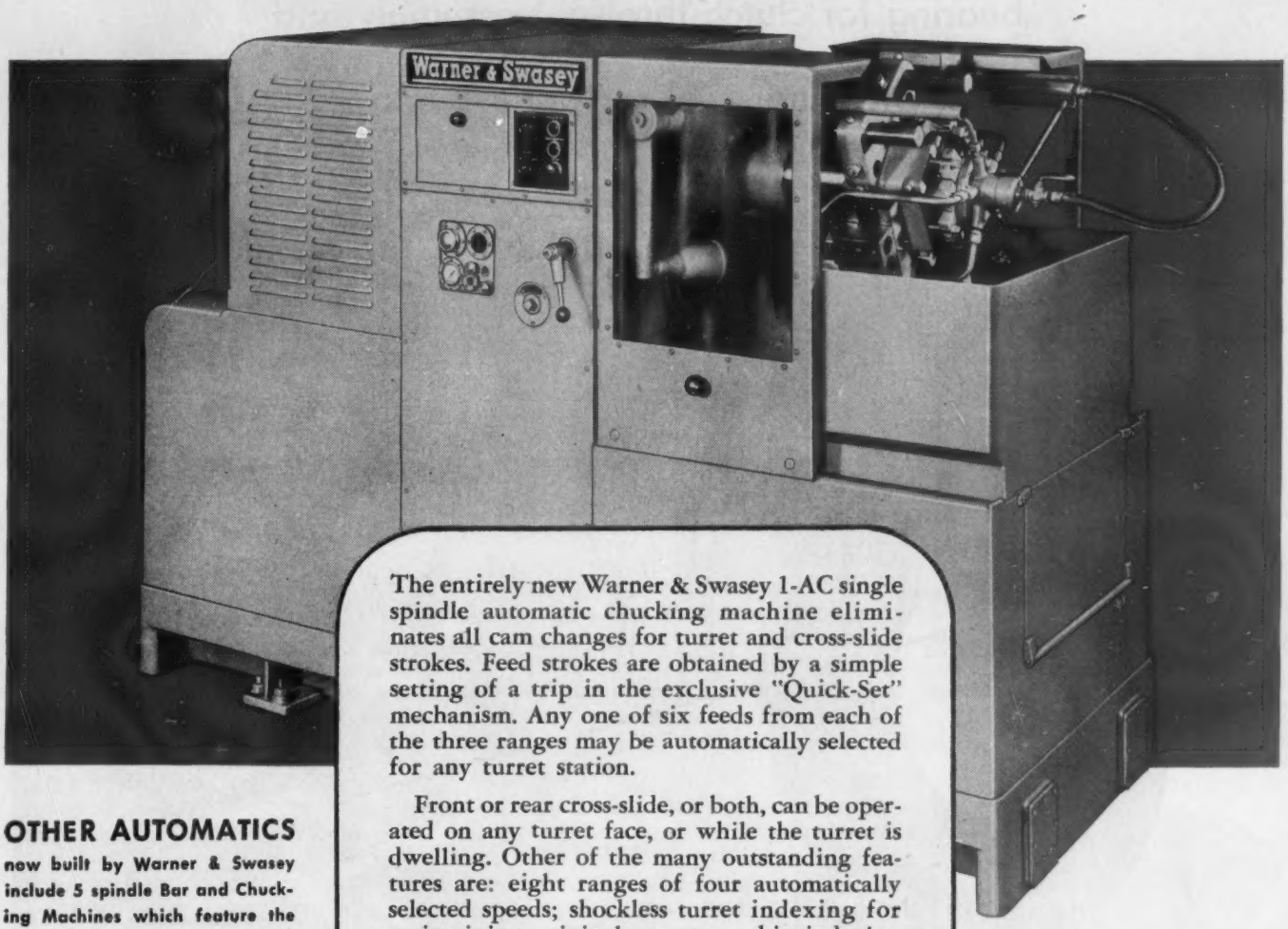
REG. U. S. PAT. OFF

ALLIED RESEARCH PRODUCTS, INC.

IRIDITE

4004 E. Monument St., Baltimore 5, Md.

No Cam Changes on this New
Single Spindle Automatic
by WARNER & SWASEY



The entirely new Warner & Swasey 1-AC single spindle automatic chucking machine eliminates all cam changes for turret and cross-slide strokes. Feed strokes are obtained by a simple setting of a trip in the exclusive "Quick-Set" mechanism. Any one of six feeds from each of the three ranges may be automatically selected for any turret station.

Front or rear cross-slide, or both, can be operated on any turret face, or while the turret is dwelling. Other of the many outstanding features are: eight ranges of four automatically selected speeds; shockless turret indexing for maintaining original accuracy; skip-indexing of turret to eliminate unnecessary approach strokes; maximum rigidity, simplicity of setup, and many new operator conveniences.

8" or 10" Chuck • 6" Turning Length

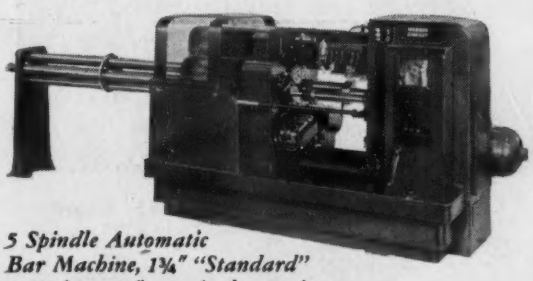
OTHER AUTOMATICS

now built by Warner & Swasey include 5 spindle Bar and Chucking Machines which feature the exclusive, patented "Quick-Set Mechanism". *This eliminates need for cams.* Work stroke settings are made by quick, simple adjustment on a graduated quadrant. The fast changeover makes it practical and profitable to use Warner & Swasey Automatics for small, medium and long runs.

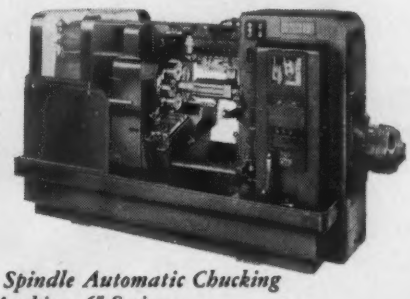
To get full, up to the minute information on the latest developments in Warner & Swasey

TURRET LATHES
AUTOMATIC CHUCKING AND BAR MACHINES
PRECISION TAPPING AND THREADING MACHINES
CHUCKS AND TURNING TOOLS AND ACCESSORIES

call in the Warner & Swasey field representative or write Warner & Swasey, Cleveland.



5 Spindle Automatic Bar Machine, 1¼" "Standard" capacity; 2¼" oversized capacity.



5 Spindle Automatic Chucking Machine, 6" Swing.

WARNER & SWASEY
Machine Tools
Cleveland

YOU CAN MACHINE IT BETTER, FASTER, FOR LESS . . . WITH A WARNER & SWASEY

GRAPHITAR helps popular automobile

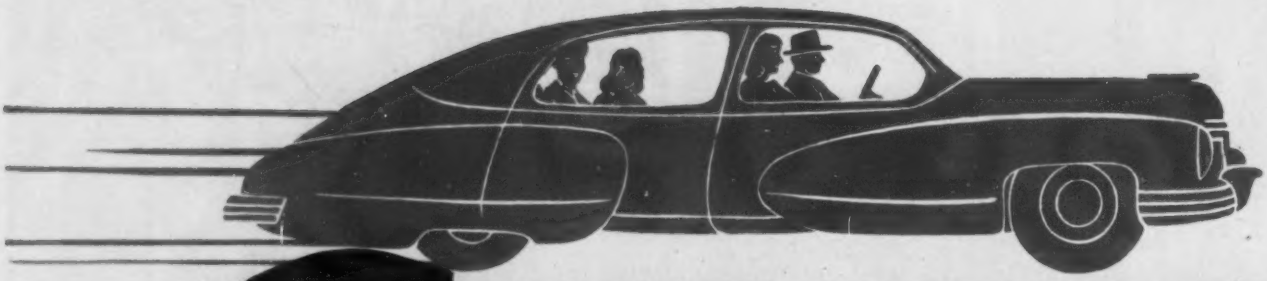
(CARBON-GRAPHITE)

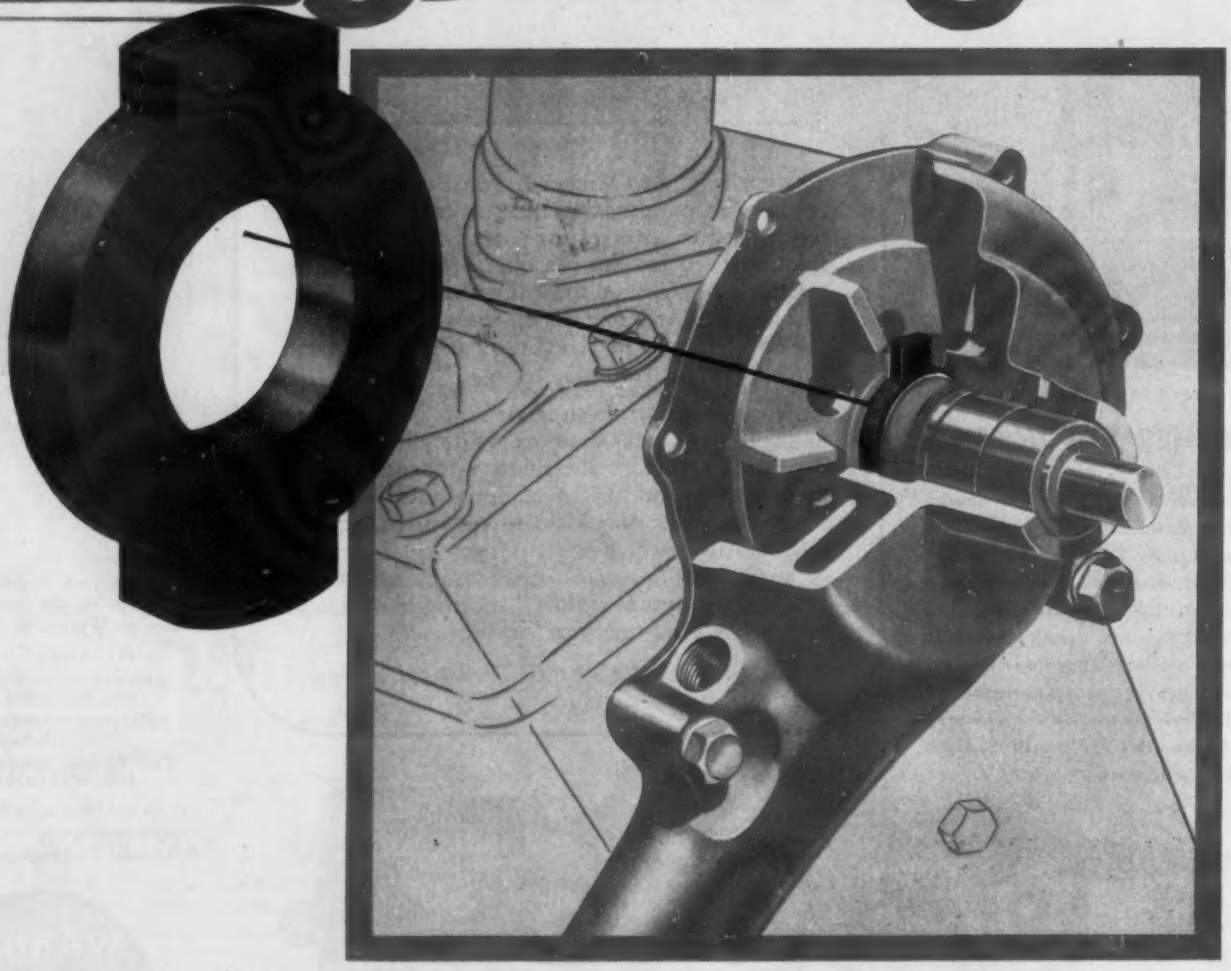
roll ahead in dependability

large automobile manufacturer* specifies Graphitar

bearing for clutch throwout assembly and

Graphitar seal for water pump





*Name Withheld by Request

THE UNITED STATES GRAPHITE

Some of the newest and finest automobiles on the highways today are rolling along with top-notch dependability that is due, in part, to Graphitar.

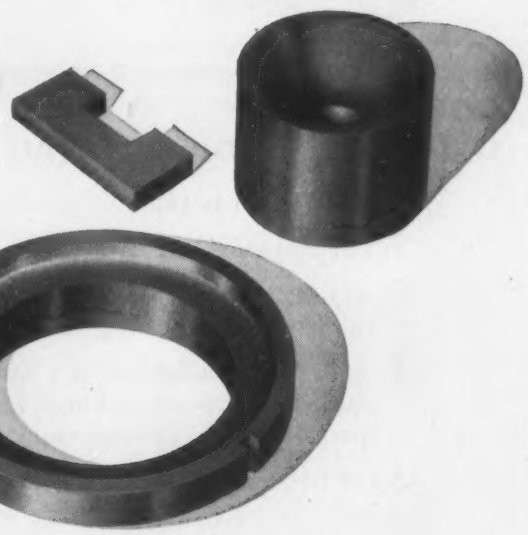
For example, one large automobile manufacturer* *specifies Graphitar* for two vital applications—the bearing in the clutch throwout assembly and the seal in the water pump. *Why?* Because Graphitar, a carbon-graphite material, requires no lubrication. It is hard, with tough wearing qualities that defy friction. It is unaffected by chemicals. It will not melt or fuse and is dimensionally stable despite sudden and extreme temperature changes. These properties help to maintain the reputation for unfailing performance that this popular car has earned.

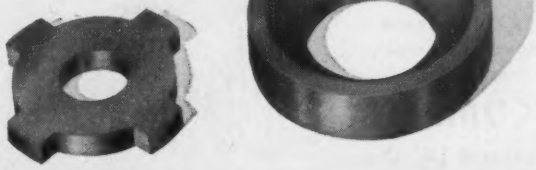
GRAPHITAR IS VERSATILE
(CARBON-GRAPHITE)

The use of Graphitar is by no means confined to the automotive industry. Manufacturers of sump pumps, steam turbines, rotary pressure joints, air compressors, and many other mechanisms are increasing the *efficiency* of their products at less cost by equipping them with Graphitar seals, rings, bearings, and vanes. Graphitar also has several applications in the glass industry, including molds and transfer pads.

We can mold Graphitar parts to any practical shape and size and finish them to close tolerances—*.0005" in small sizes.* Send us sketches or descriptions of your products and our engineers will recommend the use of Graphitar parts where they will improve mechanical performance and save you money.

ASK FOR 44-PAGE ILLUSTRATED CATALOG.





COMPANY • SAGINAW, MICHIGAN

ON STANDARD OR "SPECIAL" SET-UPS

Specify MO-MAX HIGH SPEED STEELS for your...

MILLING CUTTERS

Only MO-MAX GIVES YOU ALL THESE ADVANTAGES

1. MO-MAX has superior cutting qualities.
2. The machinability of MO-MAX is unexcelled.
3. MO-MAX is economical. Its specific gravity is about 8% less than that of 18% tungsten steel.
4. MO-MAX is available in a standardized composition; also in cobalt and high vanadium varieties for special high speed steel requirements.
5. For 14 years MO-MAX has demonstrated its superiority in all types of cutting tools.

Learn all the facts! **Send for your copy of the MO-MAX Handbook, sixth edition. Get the full story about this remarkable steel, including easy-to-follow instructions on heat treating.**

THE CLEVELAND TWIST DRILL COMPANY

1258 East 49th Street • Cleveland 14, Ohio

Buyer's Guide to Brands of MO-MAX

"LMW"	Allegheny Ludlum Steel Corporation
"MOHICAN"	Atlas Steels Limited
"BETHLEHEM HM"	Bethlehem Steel Company
"MO-CUT"	Braeburn Alloy Steel Corporation
"STAR MAX"	Carpenter Steel Company
"MOLITE M-1"	Columbia Tool Steel Company
"REX T-MO"	Crucible Steel Company of America
"DI-MOL"	Henry Disston & Sons, Inc.
"HI-MO"	Firth-Sterling Steel Company
"REX T-MO"	Halcomb Steel Company
"MOGUL"	Jessop Steel Company
"TATMO"	Latrobe Electric Steel Company
"MIDMAX"	The Midvale Company
"S. T. M."	Simonds Saw & Steel Company
"MO-TUNG"	Universal-Cyclops Steel Corporation
"V-N-2"	Vanadium-Alloys Steel Company
"VUL-MO"	Vulcan Crucible Steel Company

want...
longer bearing life?

SUPERFINISH
..assures it!

● Yes, you can double—triple—quadruple—the life of bearings with simple, precautionary measures which take only a few minutes.

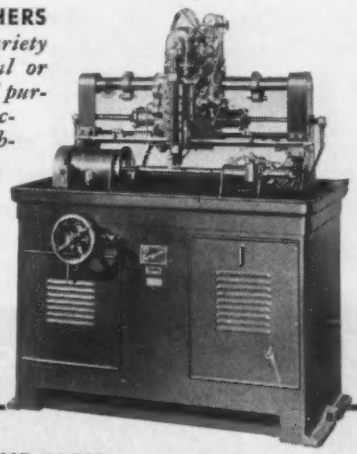
Examine a finely ground surface. No matter how smooth it may appear, it has defects in the form of grinder scratches, chatter and feed marks, and "smear metal" softened by the heat of grinding wheels. When these tiny metal ridges rub together, they rupture the protective oil film to cause scoring, excessive wear and increased clearances.

Superfinishing removes these defects—produces a bearing surface that is virtually frictionless. And its life is almost unlimited.

Superfinishing is a much quicker and more economical process than you may think. And it pays for itself many times over in better service and lower replacement cost.

Ask your nearest Gisholt Representative for the facts about Superfinishing.

GISHOLT SUPERFINISHERS *are available in a variety of types for cylindrical or flat surfaces; for general purpose or continuous production work; also as attachments for use on lathes. Write for literature.*



GISHOLT MACHINE COMPANY · *Madison 3, Wisconsin*

TURRET LATHES · AUTOMATIC LATHES · BALANCERS
SUPERFINISHERS SPECIAL MACHINES

THE GISHOLT ROUND TABLE
represents the collective experience of specialists in the machining, surface finishing and balancing of round or partly round parts. Your problems are welcomed here.

the orders read:

FULL SPEED AHEAD

for Completion of

HARBISON-WALKER'S

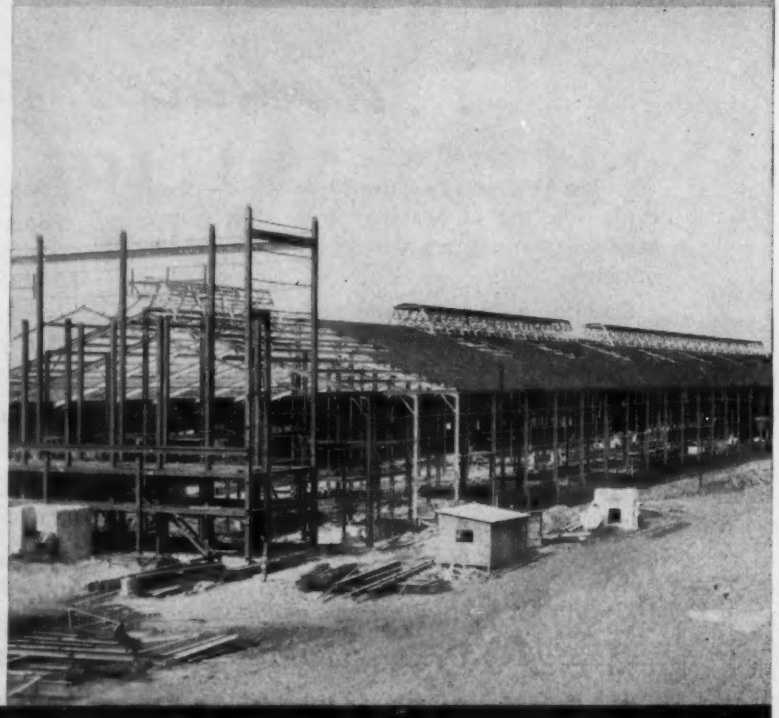
two new plants . . . . .

Baltimore, Maryland

Interior view of part of the new H-W plant for production of basic refractories. Photograph taken in September.

Fulton, Missouri

The new H-W plant for production of fireclay, super-duty fireclay, and high alumina refractories. Photograph taken in October.



Construction of our new plants at Baltimore, Md. and Fulton, Mo., is proceeding rapidly, and before long they will be producing large quantities of H-W refractories urgently required by industry.

Both plants are entirely new in conception and design and represent the accumulation of over 75 years' experience in making all types of refractories.

Some H-W refractories are still in short supply, but we will do our best to fill your orders promptly. Let us know your needs.

TRADE MARK

REG. U.S. PAT. OFF.

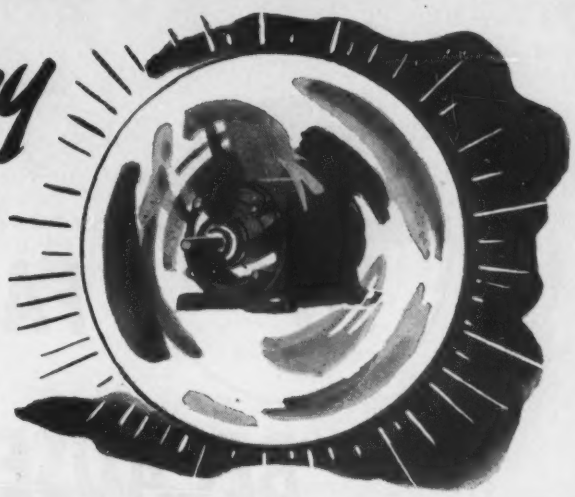
HARBISON-WALKER REFRACTORIES COMPANY

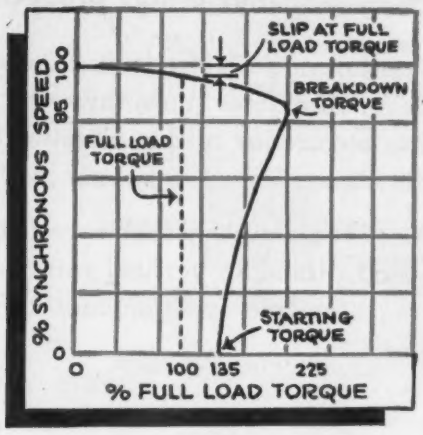
and Subsidiaries

WORLD'S LARGEST PRODUCER OF REFRACTORIES

General Offices, Pittsburgh 22, Penna.

Here's One Way to Choose Motors...

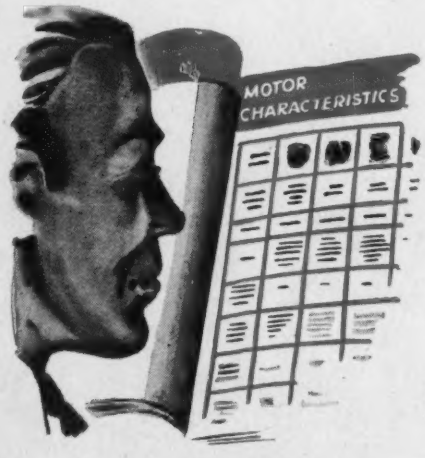




Sure, Your Local "Swami" can pick a motor for you in an instant! But if you want motor counsel you can *bank* on . . . you'll consult a reputable motor manufacturer. In place of crystal-ball gazing, he'll advise you to follow *practical* and *orderly* steps in arriving at *right* motor selection. For example...

First, Study Your Power Supply . . . voltage, frequency, number of phases; the p.f. required by your utility. Judicious selection will help balance your motor capacity . . . lower power costs. And check the voltage regulation — choose motors with enough torque to start and carry the load. Next . . .

Study the Driven Machine and surroundings. What hp? What starting torque? Will you need a horizontal or vertical motor — direct-connected, belt-driven or gear-operated? How about surroundings — ambient temperature, moisture, corrosion, dust. Each calls for a particular type of protection. Now . . .



Study Your Motor Characteristics. *A-c motors?* For most jobs they're satisfactory and economical. *D-c motors?* For wide speed range; for fast acceleration or reversal they may prove your best bet. *Synchronous motors?* When applicable they give you low-cost p.f. correction. You're *still* undecided? Call in your nearby Allis-Chalmers motor expert. He'll be glad to help you decide—with recommendations backed by 50 years of motor-building!

Wise Motor Choice Saves Power; Ups Profit!

YES, CRYSTAL-BALL GAZING methods are out when you're trying to get *maximum* return on your electric motor investment. Slip-shod selection usually results in over-capacity, high power and maintenance bills — the kind of costs that in the competitive era of tomorrow you won't be able to afford!

That's why it pays to know more about *all* types of motors . . . their operation . . . limitations . . . maintenance. And there, too, is where your Allis-Chalmers motor expert can be of real help! ALLIS-CHALMERS, MILWAUKEE.

A 2328

1847 1947
A CENTURY OF SERVICE to Industry
THAT MADE America Great

ALLIS-CHALMERS

One of the Big 3 in Electric Power Equipment-
Biggest of All in Range of Industrial Products

P&H

"PF"

Class AWS-ASTM E6012

FASTER WELDING

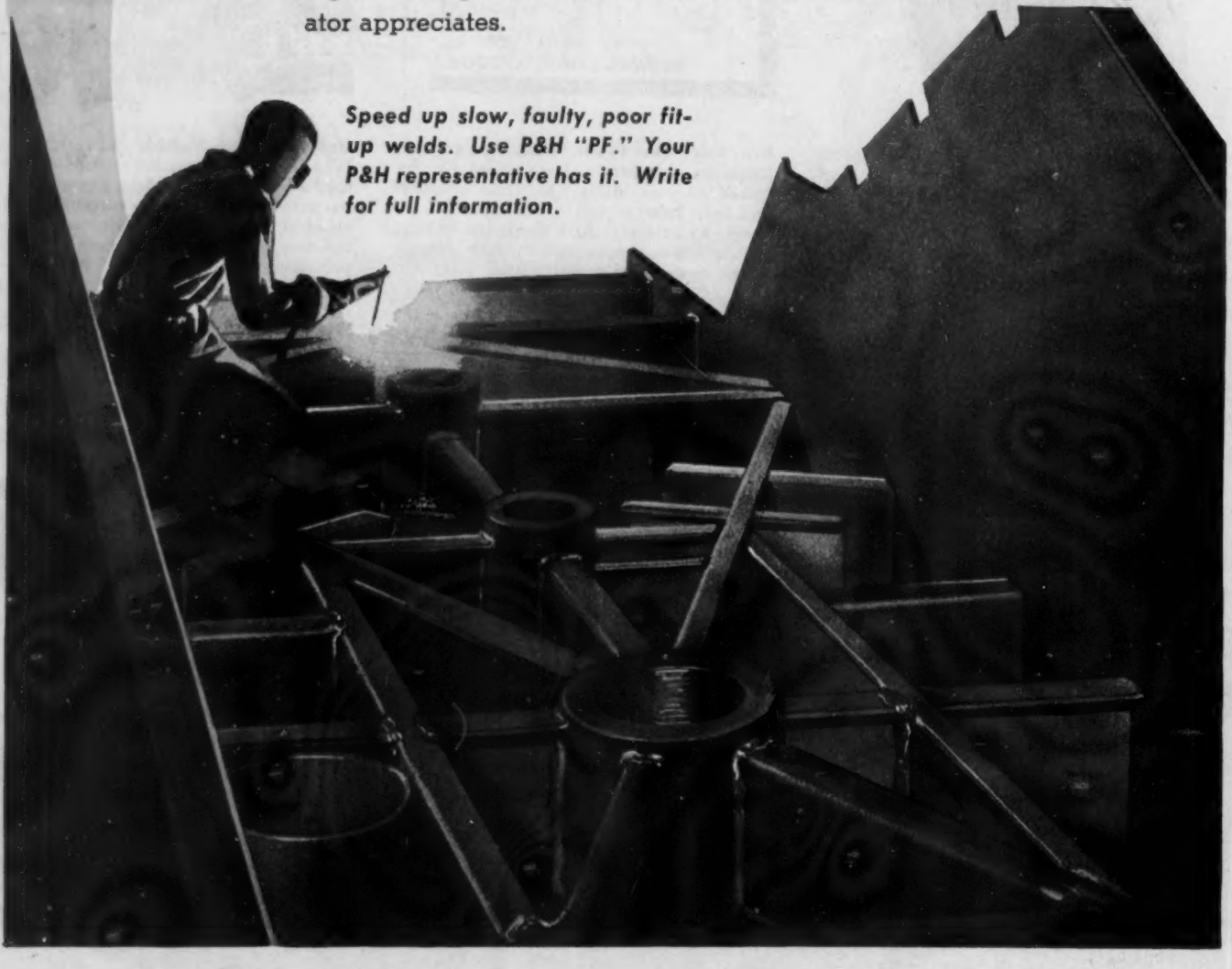
OF POOR FIT-UPS

BECAUSE OF FASTER SETTING!

Here's a P&H Electrode that brings production speed to poor fit-up welding

"PF" is a faster performing electrode in this work because weld metal solidifies faster . . . eliminates "burn through." You can use higher heats than with other electrodes of this classification. This means less bead crown, less finishing. Very low spatter loss reduces cleaning time.

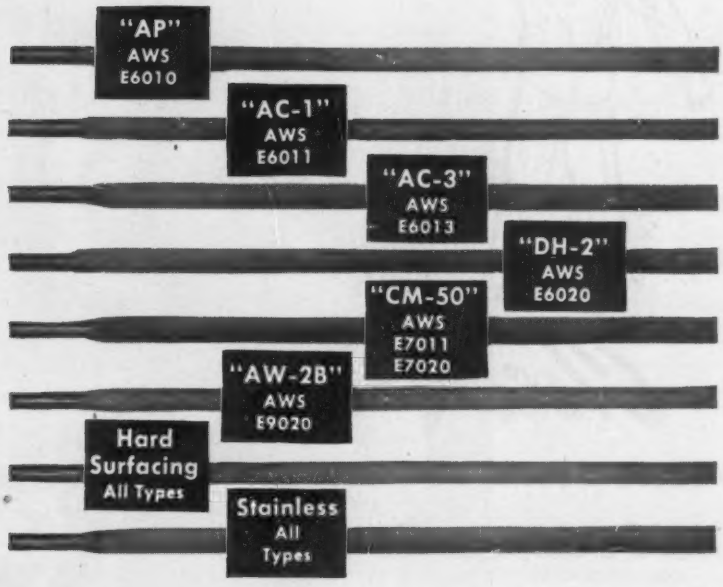
What's more, "PF" provides weld deposits that are machinable as welded or heat treated. Ideal for vertical and overhead work. Its ease of handling and comparative small amount of smoke are features every operator appreciates.



Speed up slow, faulty, poor fit-up welds. Use P&H "PF." Your P&H representative has it. Write for full information.

P&H *Everything for* ARC WELDING

You will find ready answers to your welding problems in the broad P&H line. Shown are just a few of the many P&H Electrodes which include a type and size for every production and repair-welding need. Call on this unique service. Call your local P&H Distributor or write us.



P&H

WELDING ELECTRODES

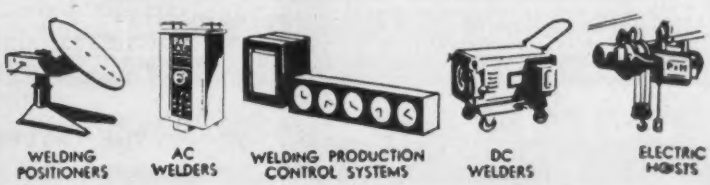
4411 W. National Avenue
Milwaukee, 14, Wisconsin

HARNISCHFEGER CORPORATION

WELDING ELECTRODES • MOTORS • HOISTS P&H ELECTRIC CRANES • ARC WELDERS • EXCAVATORS

Welding Positioners • AC Welders • Welding Production • Control Systems • DC Welders • Electric Hoists.

AMERICA'S MOST COMPLETE ARC WELDING SERVICE



WELDING POSITIONERS | AC WELDERS | WELDING PRODUCTION CONTROL SYSTEMS | DC WELDERS | ELECTRIC HOISTS

Electrical Controls

FOR RESISTANCE WELDERS

"One Package"

Check

THESE ADVANTAGES—

1. Accurate timing is provided by D. C. timing circuits which operate on closely regulated bias and timing voltages to compensate for wide variations in power supply voltage.
2. Control units readily accessible.
3. Modern appearance—smooth exterior with no projections, knobs or handles.
4. Timing dials graduated in cycles for each frequency (60, 50 and 25 cycles per second).
5. Easy to install on welder.

New Bulletin 10-213 tells all about T-W's new non-synchronous coordinated controls for resistance welders. Your copy mailed promptly upon request.

By using T-W welders and controls, the complete responsibility is placed with one manufacturer, not only for the initial installation but also for service and renewal parts.

These controls, developed by Taylor-Winfield, can be used with foot, air, motor and hydraulically operated spot, projection, butt and seam resistance welders.

TAYLOR-WINFIELD
RESISTANCE WELDERS

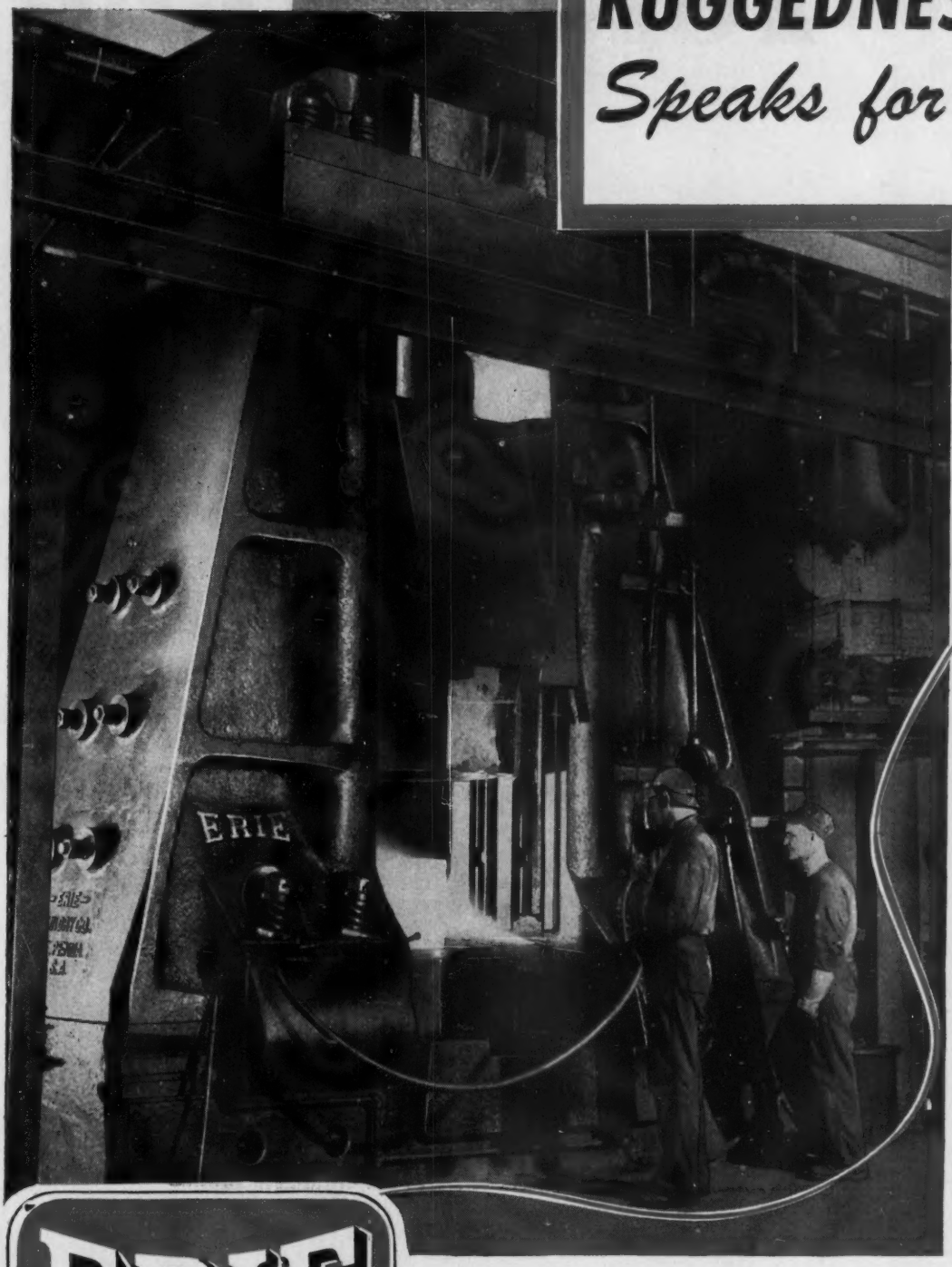
Now you can obtain a complete resistance welding installation from one of the oldest manufacturers of resistance welders . . . Taylor-Winfield.

One package means better all-around production performance from your resistance welders. We know how controls should be made to assure high speed, consistent welds. We know, too, what you want in controls for high speed resistance welding operation.

These new T-W controls are the answer.

THE TAYLOR-WINFIELD CORPORATION
WARREN • OHIO

ERIE HAMMERS *are Built with* RUGGEDNESS *that Speaks for Itself*

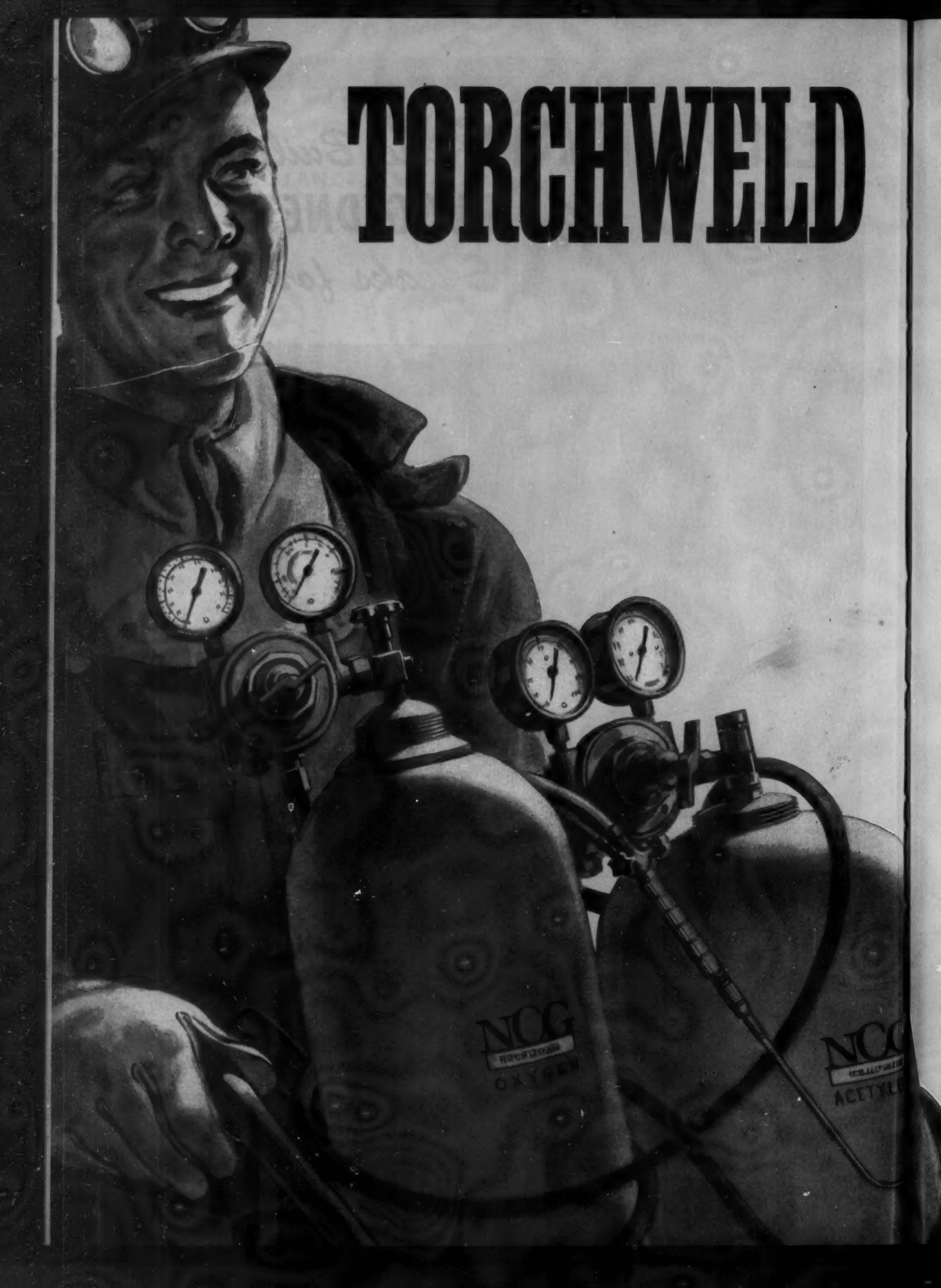


ERIE

For full details write for Bulletin 340

ERIE FOUNDRY COMPANY • *Erie, Pa., U.S.A.*

ERIE BUILDS *Dependable* **HAMMERS**


TORCHWELD
NCG
OXYGEN
NCG

simpler!
works better!
costs less!

NCG

EVERYTHING FOR WELDING

NCG is recognized as one of the largest organizations of its kind in the world. It operates 73 manufacturing plants within the United States, offers supply and service by a vast network of hundreds of independent NCG distributors and warehouse stocks. For assured satisfaction in *your* welding and cutting needs . . .

RELY ON NCG

Torchweld is more than a line of really good flame welding and cutting apparatus—it's a factor in economics—in the economics of *your* business. You see . . . NCG knows that the test of equipment isn't completed until the product made with that equipment has satisfied *your* customers. NCG knows that the production efficiency of equipment has no real meaning until the maintenance liability of that equipment is known. NCG knows that equipment is, in the final word, an influence on *your* profits.

NCG's wisdom from 30 years' experience with the overall applications of welding in every phase of U. S. industry, is built into the Torchweld line. Torchweld may be said to have "a seasoned business man's" regard for *all* your problems.

And Torchweld pleases the man in the goggles just as much. When he uses the famous "54" Welding Torch, for instance, he recognizes instantly that the new, revolutionary "Stab-L-Flow" mixer gives him greater speed and better welds. He finds that the welding flame is truly stabilized, and that his torch doesn't pop and can't backfire.

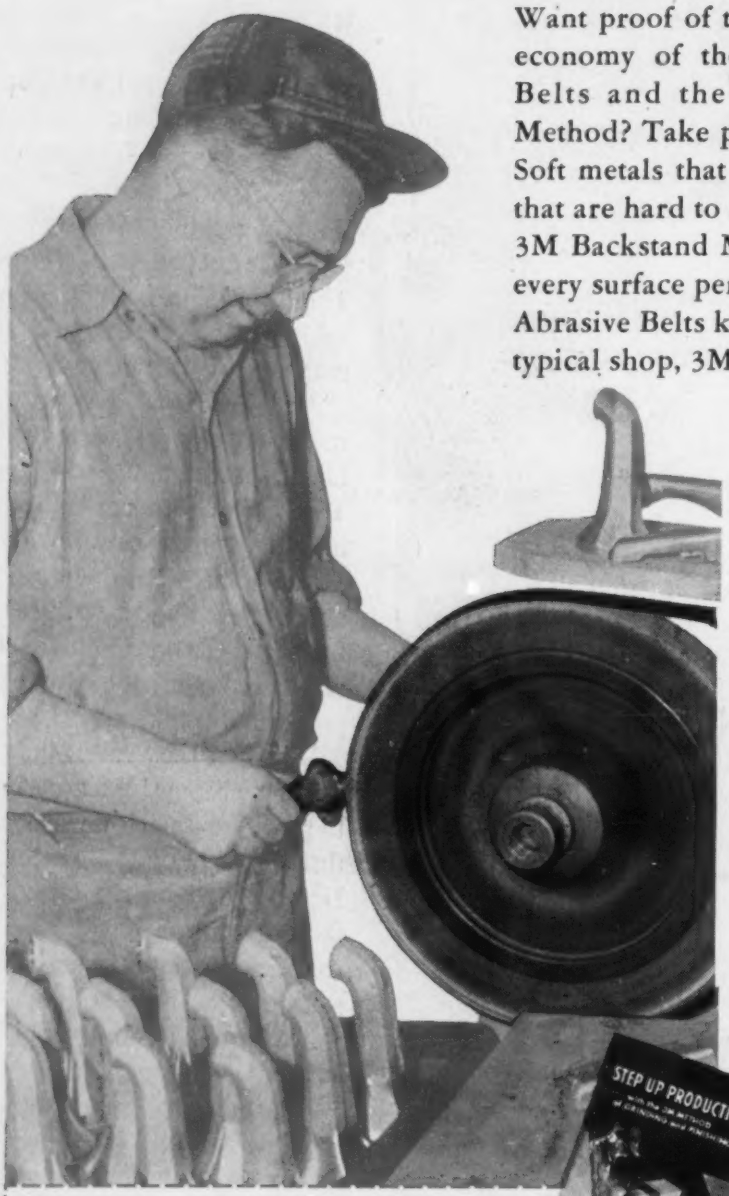
If he uses the "75" Hand Cutting Torch he beams his astonishment at the swift ease with which it sails through steel up to 20 inches thick. He is proud of the clean, square faces and the narrow kerf. He is sure to become enthusiastic about the stainless steel head and the smooth-working diaphragm-type high pressure oxygen valve.

But these promising examples are just typical of the entire quality Torchweld line—that costs less, both initially and to use—that's simpler and works better, no matter to what task it's assigned. Send today for the new, complete Torchweld catalog that's sure to point a way to profitable improvement in *your* business.

NATIONAL CYLINDER GAS COMPANY
840 N. MICHIGAN AVE., CHICAGO 11, ILL.

TYPICAL EXAMPLE:

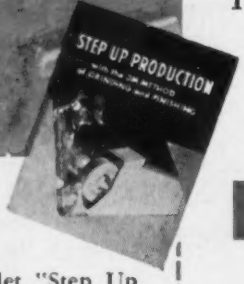
Production boosted... Grinding costs slashed 40%



Want proof of the versatility and economy of the 3M Backstand Belts and the 3M Backstand Method? Take plumbing fixtures. Soft metals that must be carefully handled. Radical contours that are hard to reach. Finishes that must be near-perfect. The 3M Backstand Method makes it possible to reach and finish every surface perfectly while the uniform cutting action of 3M Abrasive Belts keeps final buffing costs at rock bottom. In one typical shop, 3M Backstand Belts have stepped up production, *chopped costs 40%, reduced rejects by half.*

3M service, however, goes much further than the manufacture of good Backstand Belts. 3M Abrasive Engineers go out into the field and develop better ways to use them to slash your production costs. Manufacturers in every field come to us with finishing problems and we work with them in their own shops to find practical answers.

In fact, you can get a whole bookful of answers by sending the coupon. And if you have a problem that calls for more than that, get in touch with your 3M Distributor or ask us to have a 3M Abrasives Engineer check into things for you. It'll be a pleasure.



Minnesota Mining & Mfg. Co., Dept. S-1147
Saint Paul 6, Minnesota

Please send me a free copy of your booklet "Step Up Production"

Name.....

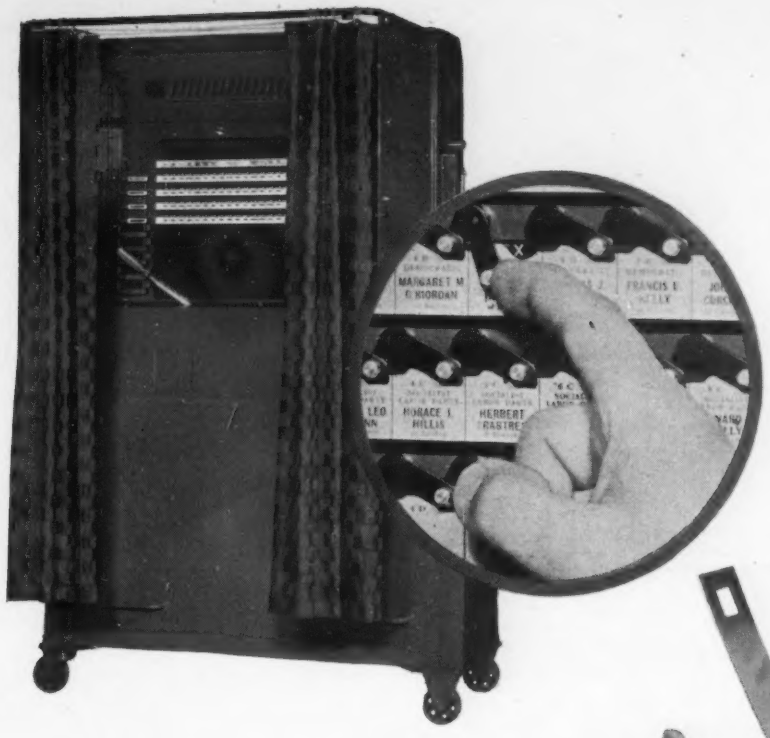
Address.....

City..... *Zone*.... *State*.....

3M
BACKSTAND BELTS

ANOTHER 3M COMPANY PRODUCT

Made in U. S. A. by
MINNESOTA MINING & MFG. CO.
Saint Paul 6, Minn.



When Brass does the counting your vote is secret and safe

After the candidates have had their say and the orators are hoarse, the *real* voice of America goes to the polls . . . and makes its choice known by means of the secret ballot.

And each year, more of the millions of votes cast are being recorded on automatic voting machines. The vast majority of these are made by the Automatic Voting Machine Corporation of Jamestown, New York.

Fool-proof and fraud-proof, the voting machine is ingeniously designed to meet Election Day problems. Voting is easier, quicker, safer. There are no spoiled or defective ballots. Accurate counts for all candidates are immediately available when the polls close . . . recorded on the registering counters like miles on a speedometer.

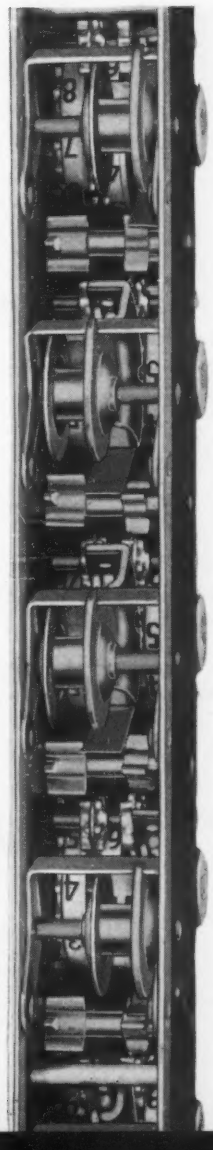
Copper and its alloys play an important part in the dependable operation and long life of the modern voting machine. Between the recording levers on the front, and the registering counters on the back, are hundreds of intricately formed and machined parts of copper, brass and bronze. The American Brass Company supplies these metals in the exacting forms, tempers and compositions most suitable for their use.

THE AMERICAN BRASS COMPANY

General Offices: Waterbury 88, Connecticut

ANACONDA
from mine to consumer

Anaconda
COPPER and BRASS



At left is shown a partial view of an assembled counter column used in the Jamestown Automatic Voting Machine. Only four of the miniature, adding-machine-like registers can be seen, yet as many as 600 such assemblies are used in the larger models. The parts illustrated above are typical of the thousands going into each machine. All are made of Anaconda Alloys in the form of sheet, strip, rod and wire.

Most Versatile of all commercial metals

STRONG • WORKABLE • DURABLE

. . . and good-looking too!

Copper, Brass, Bronze and Nickel Silver have long been known as the most serviceable of all commercial metals . . . yet they rank high among those that can be readily machined, forged, rolled, spun, stamped, pressed, coined, upset or drawn.

While these metals are strong and tough, they are easy on production equipment, too. They can be readily fabricated on standard machines, with added economies through longer life for punches, dies and cutting tools.

Attractive in their own right, Copper, Brass, Bronze and Nickel Silver also serve as a non-rust base for enameled, lacquered, plated or other applied finishes. Products made of these metals are more readily marketable . . . combine longer service life with greater sales appeal.

When ordering Copper, Brass, Bronze, or Special Copper Alloys, specify "Anaconda"—it's your assurance of getting time-tried, dependable metal . . . made by The American Brass Company and unsurpassed in quality and uniformity. 47121

THE AMERICAN BRASS COMPANY

General Offices: Waterbury 88, Connecticut

Subsidiary of Anaconda Copper Mining Company

In Canada: Anaconda American Brass Ltd., New Toronto, Ont.

ANACONDA from mine to consumer

Anaconda

COPPER & COPPER ALLOYS

SHEETS • WIRE • ROD • TUBES • SPECIAL SHAPES • DIE PRESSED FORGINGS

TO hold parts rigidly in place—and to provide for quick, easy adjustment—makers of farm equipment and other machinery manufacturers specify "Ferry Cap Set Screws."

These set screws are case hardened—the hard point *bites in* and *holds.* They fit perfectly and respond readily to adjustment needs.

"Ferry Cap Set Screws" are expertly made by the first company to produce Cup Point Set Screws by the cold upset process of manufacture. They embody the skill and experience gained in 38 years of precision manufacturing.

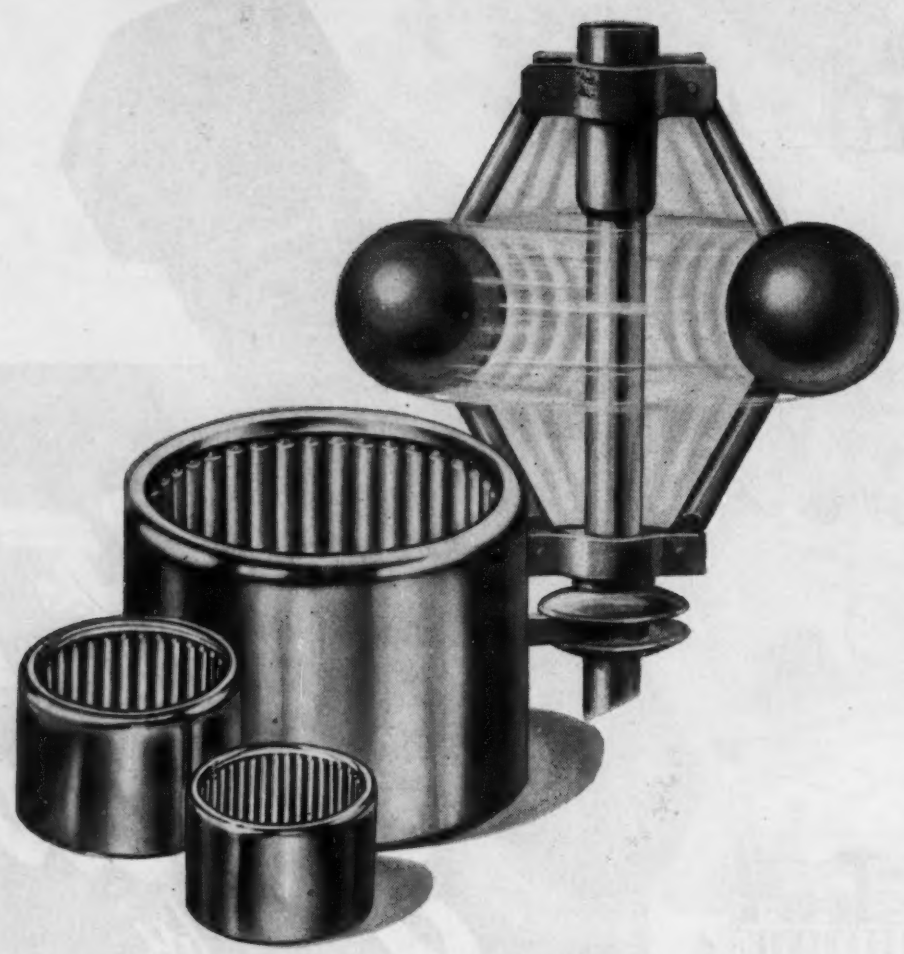
Square head and headless—cup and oval point—case hardened—sizes ¼" diameter and larger. Carried in stock for immediate shipment.

The FERRY CAP & SET SCREW Co.

2159 SCRANTON ROAD Dept. A-14 CLEVELAND 13, OHIO

EXPORT MANAGER: ERNEST W. LENZ, 280 BROADWAY, NEW YORK 7, N. Y.

CAP AND SET SCREWS • CONNECTING ROD BOLTS • MAIN BEARING BOLTS • SPRING BOLTS AND SHACKLE BOLTS • HARDENED AND GROUND BOLTS • SPECIAL ALLOY STEEL SCREWS • VALVE TAPPET ADJUSTING SCREWS • AIRCRAFT ENGINE STUDS • ALLOY STEEL AND COMMERCIAL STUDS • FERRY PATENTED ACORN NUTS



Govern costs, too . . .

by keeping first cost down, simplifying design, fabrication and installation, and reducing operating and maintenance expense. These advantages can be secured

With Torrington Needle Bearings.

Their compact construction permits savings in size and weight of surrounding members. Machining the housing and installing the bearings are simple, speedy operations. Their low coefficient of friction provides economy in power consumption, while their efficient lubrication prolongs the life of the bearing with a minimum of attention.

If cost is one of the factors governing your product development, it will pay you to consider these Torrington Needle Bearing features.

THE TORRINGTON COMPANY

TORRINGTON, CONN. SOUTH BEND 21, IND.

Offices in All Principal Cities

TORRINGTON BEARINGS

• NEEDLE • SPHERICAL ROLLER • STRAIGHT ROLLER • TAPERED ROLLER • BALL •

Only TRADE Verson MARK gives you

these 10 Outstanding HYDRAULIC PRESS features

1. With HYDROL, the new simplified hydraulic circuit by Verson, high pressure lines have been shortened, valving and piping reduced to an absolute minimum.
2. Verson improved high tensile strength, automotive type cylinder provides positive straight-line reciprocating motion of the platen.
3. Verson "Velvet Touch" shockless sliding seatless type surge valve.
4. Controls and valves readily accessible for adjustment.
5. Automatic changeover to full pressure made smoothly—without shock—before punch contacts the work.
6. HYDROL circuit incorporates automatic decompression, virtually eliminates dwell period before reversal can be made.
7. 4-point SQUARE TYPE gibs with renewable bronze liners, are adjustable in two directions.
8. Electrically controlled press operation, may be arranged for single stroke and continuous cycle production.
9. Accurately guided Verson cushions on renewable guides, to give full even blank-holding through entire stroke.
10. All Verson Presses feature the allsteel welded frame originated by Verson over 25 years ago.

Send for your copy of the Complete New factual HYDRAULIC PRESS Catalog

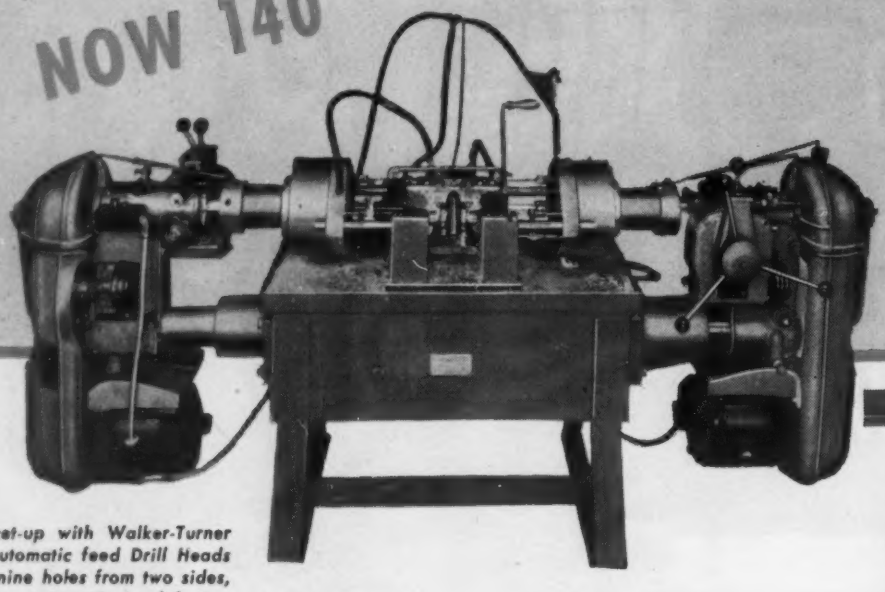
VERSON ALLSTEEL PRESS CO. 8318 So. KENWOOD AVENUE • CHICAGO • ILLINOIS

Originators and pioneer builders of Allsteel Welded Presses

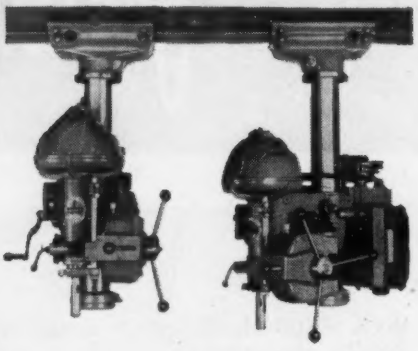
~~25~~ PIECES PER HOUR

NOW 140

20" POWER FEED WALKER-TURNER Drill Heads



This set-up with Walker-Turner 20" automatic feed Drill Heads drills nine holes from two sides, in one automatic push-button cycle.



Two Walker-Turner standard 20" Power Feed Drill Heads mounted on a sliding carriage supported by an "I" beam. Heads move radially and swing horizontally through a complete circle.

The Du-Fold Mop Manufacturing Company of Cleveland recently increased the production of metal mop heads by nearly 500% by using two Walker-Turner Drill Presses in a special set-up with Zagar gearless drill heads.

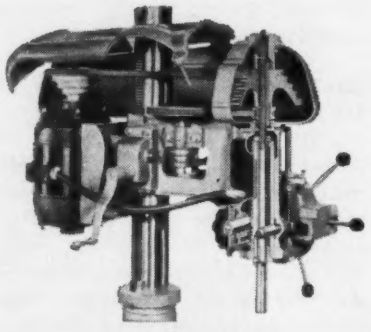
One head drills five and the other four holes—at opposite ends. The work locates automatically. A push button starts the complete cycle including retraction of heads.

"VERY DIFFICULT PROBLEM SOLVED," *says DuFold*

"It has really solved a very difficult drilling problem for us and we will be placing another order shortly," is the comment on this Walker-Turner job.

We used your 20" power feed drill presses in the manufacture of 40 mm. tracer shots during the war and we were so well satisfied with them that we did not consider any other make.

The wide range of speeds and the 10 spline spindle with no play and low investment cost are other reasons why Walker-Turner drill presses were chosen for this set up.



20" Power Feed Drill Press Head. Five standard spindle speeds, 400 to 2600 r.p.m. with 1740 r.p.m. motor. Capacity 1" in cast iron, ¾" steel.

*Price less motor **$216.00***

TWENTY-FIFTH YEAR
1922 1947

*F.O.B. Plainfield—
Slightly higher west of the Rockies and in Canada

SOLD ONLY BY AUTHORIZED INDUSTRIAL MACHINERY DISTRIBUTORS 165

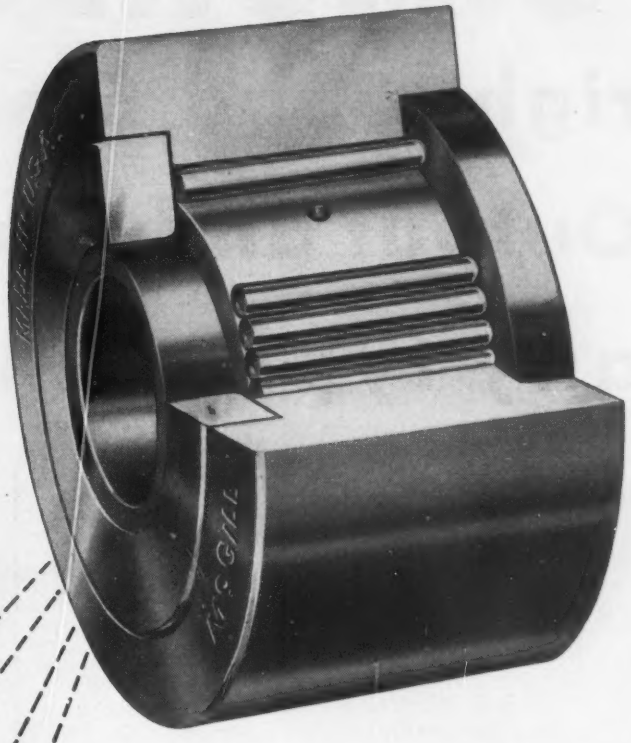
walker-Turner COMPANY, Inc. PLAINFIELD, N.J. U.S.A.

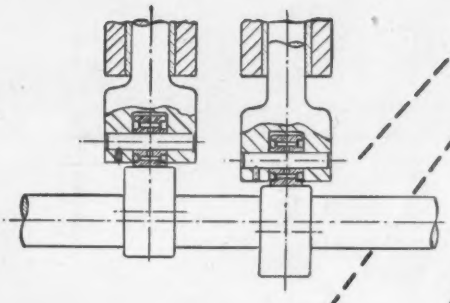
MACHINE TOOLS

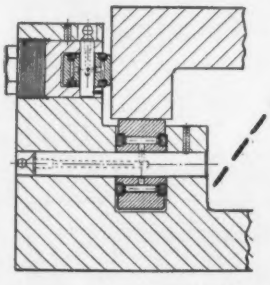
DRILL PRESSES—HAND AND POWER FEED • RADIAL DRILLS • RADIAL SAWS
METAL-CUTTING BAND SAWS • POLISHING LATHES • FLEXIBLE SHAFT MACHINES
RADIAL CUT OFF MACHINES FOR METAL • MOTORS • BELT & DISC SURFACERS

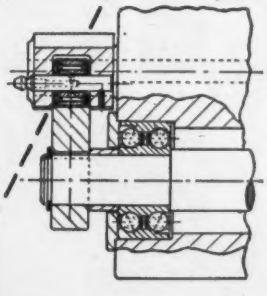
. . . another McGILL first

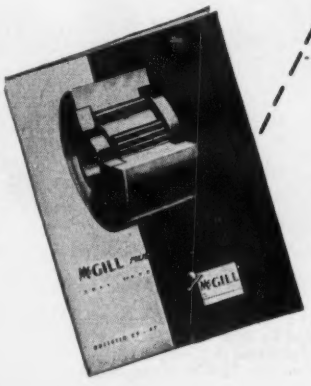
THE NEW McGILL MULTIROL® CAM YOKE ROLLER











Write for your free copy of Bulletin CY-47 on the new Multirol CYR Bearings.

McGill MULTIROL Cam Yoke Roller Bearings represent the latest development in full type roller bearings. The new CYR Series will provide greater adaptability of MULTIROL Cam Followers for all types of automatic machinery. They are specially suited for cam action or controlled motion of machine parts requiring guide or support rollers.

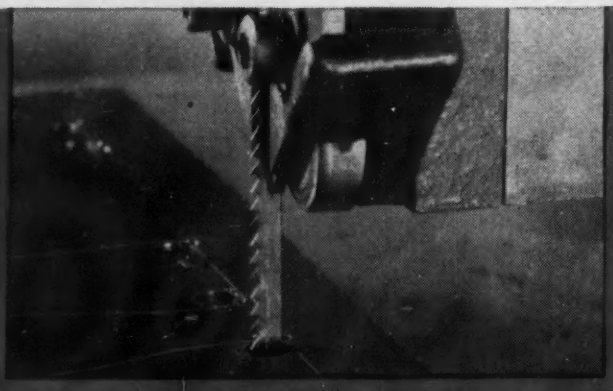
With an inner race replacing the usual stud, a full range of shaft sizes can be accommodated from .250 to 1.25 resulting in almost unlimited methods of mounting. The outer race sections are built extra heavy for shock load resistance and with the same internal construction as the MULTIROL Cam Follower Series. Send your problems to McGill Engineers, McGill Manufacturing Company, Inc., 401 North Lafayette Street, Valparaiso, Indiana.

McGILL precision bearings

SIMONDS gives you the right Band Saw to deliver Top Output and Economy in cutting any type of Metal or Plastic

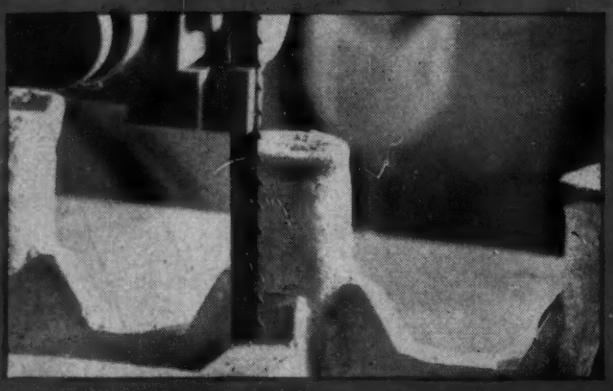
1. REGULAR HARD EDGE BAND SAWS

Simonds Steel Mills produce a special tough alloy steel for these saws. Teeth are sharp, perfectly milled, and set even on both sides of blade, to give clean, easy cutting and long saw life. And joints are welded for equal strength with rest of blade.



2. SKIP-TOOTH BAND SAWS

Here's the extra gullet-capacity for large chips from aluminum, magnesium, plastics and wood. These saws stay sharp so long that it's economical to replace them and save resharpening. They have the same hardened tooth-edge as the Regular Hard Edge Saws. Made in widths from ½" to 1" Tooth-spacings: 2, 3, 4, and 6 per inch.



3. SPRING TEMPER BAND SAWS

Especially successful in sawing thin sheet aluminum, magnesium, and steel . . . also brass, light structural shapes, plastics, fibre, non-ferrous tubing and similar materials. These blades cut for exceptionally long periods without dulled teeth . . . and then they are quickly reset and filed and put back on the machine.

Consult your Industrial Supply Distributor about the best type and specification of Simonds Band Saw for *your* work. Or write the nearest Simonds office.

SIMONDS
SAW AND STEEL CO.
FITCHBURG, MASS.

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SIMONDS STEEL MILLS — SIMONDS SAW AND STEEL CO. LOCKPORT, N. Y. — *Special Electric Furnace Steels*

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Key piece in solvent degreasing

Distributors of Du Pont Degreasing Solvents are located in important manufacturing cities, within easy call from your plant. Backing up their efforts are the Du Pont Technical Representatives. They are available, on short notice, to work with you, to be of service to you in degreasing applications.

If things aren't working out the way you think they should . . . if you feel that your solvent losses are too high . . . that you're not getting the best results from equipment or solvent . . . or you have some question about how to handle and use the solvent . . . just call or write to the nearest Du Pont distributor. And you'll get a competent man, thoroughly familiar with degreasing, a man who will help you come up with the answer to your problem. If field tests don't provide a quick answer, there's a supporting group of engineers, chemists and specialists, research and laboratory facilities in Niagara Falls to fall back upon for even more help.

★ ★ ★

ABOUT DU PONT DEGREASING SOLVENTS

Under various trade names, Du Pont Trichlorethylene and Perchlorethylene solvents for metal cleaning have been in wide use for many years. They are the best Vapor Degreasing solvents we've ever made—the best we know how to make. Use them with complete confidence and assurance for all metal degreasing work. E. I. du Pont de Nemours & Co. (Inc.), Electrochemicals Department, Wilmington 98, Delaware.

Tune in to Du Pont "CAVALCADE OF AMERICA," Monday nights—8 p. m. EST, NBC

DU PONT SOLVENTS for VAPOR DEGREASING

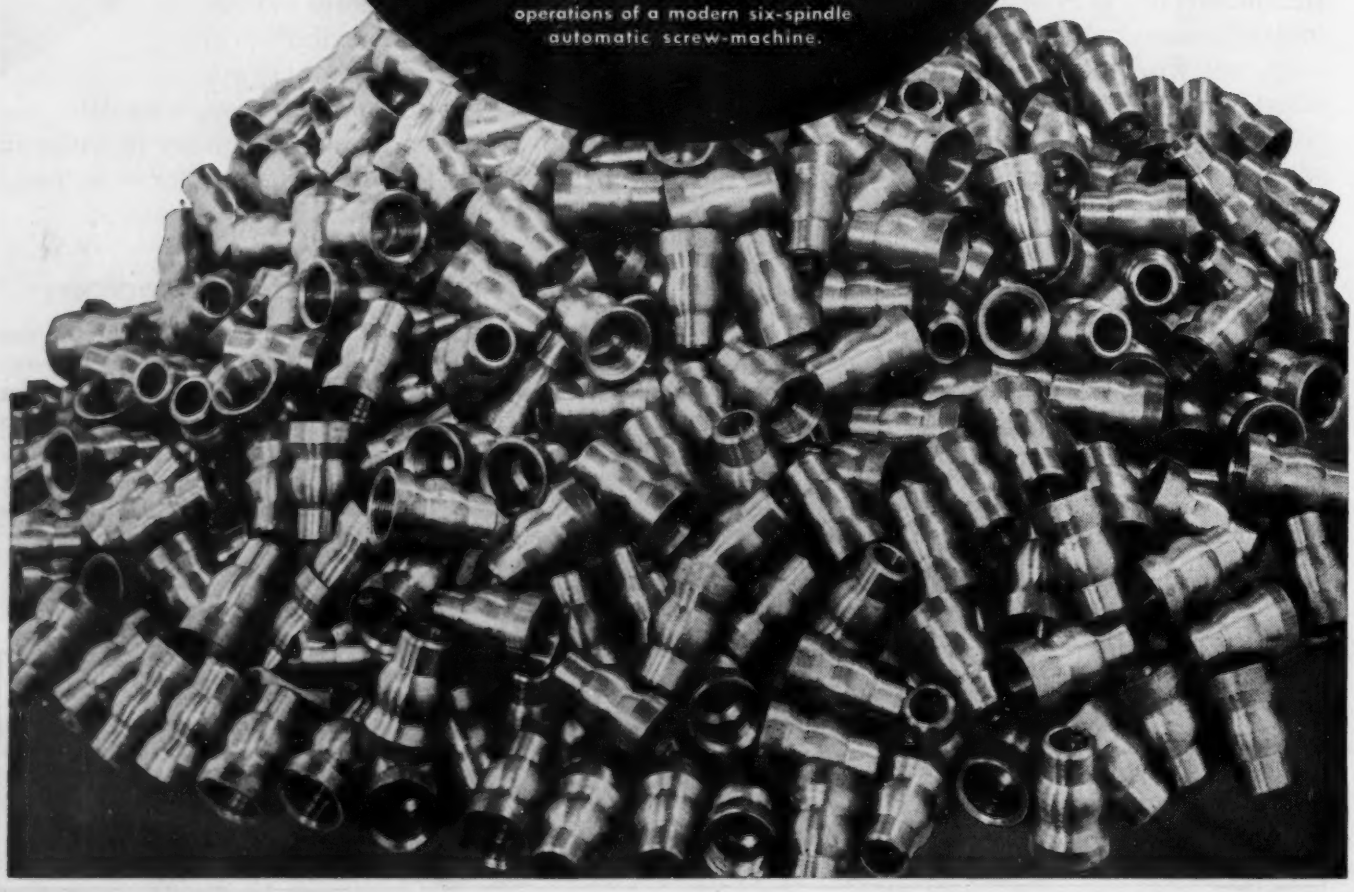
SOLD NATIONALLY THROUGH DISTRIBUTORS

DU PONT

BETTER THINGS FOR BETTER LIVING . . . *THROUGH CHEMISTRY*

Useless Parts

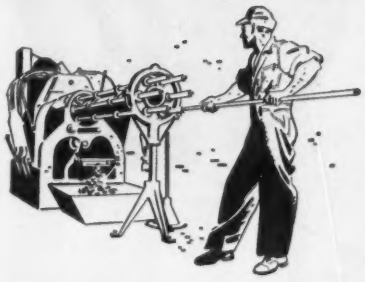
This part utilizes all common operations of a modern six-spindle automatic screw-machine.



WITH A USEFUL PURPOSE

—to give you better

MACHINABILITY



Millions of these little steel parts have been made during the past 17 years on modern automatic screw machines in the Republic Union Drawn plant at Massillon. And even though not a single one can be used for a practical application, every part has served a very useful purpose.

They are standard test parts—specially designed to incorporate all common machining operations on an "automatic".

In producing them, tons of steel of all standard and many experimental analyses have been cut up by an experienced operator under actual shop conditions. Various speeds and feeds have been employed and records carefully kept of the behavior of the steel, surface finish, tool life and production time.

During all these tests, Republic metallurgists and engineers have made an intensive study of the records to learn more about the machining characteristics of steel—with these results:

1. Substantial improvement made time after time in the machinability of Republic Union Cold Drawn Steels.
2. The development of new free-machining steels.
3. The helpful tables of recommended speeds and feeds in the Union Drawn Steel Handbook.
4. Assistance given to hundreds of parts producers by Union Drawn Field Men.

This full knowledge of the behavior of cold drawn steels as they are used under all conditions in actual plant production is one of the reasons why Republic Cold Drawn Steels are "out front" in *MACHINABILITY* today—why Union Drawn metallurgists and engineers frequently can help you improve quality, step up production efficiency and cut unit costs.

REPUBLIC STEEL CORPORATION
Union Drawn Steel Division • *Massillon, Ohio*
GENERAL OFFICES • **CLEVELAND 1, OHIO**
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REPUBLIC STEEL REG. U. S. PAT. OFF.

UNION COLD DRAWN STEELS

Free-Machining Bessemer, Alloy and Enduro Stainless Steels

•

Union Cold Drawn Special Sections

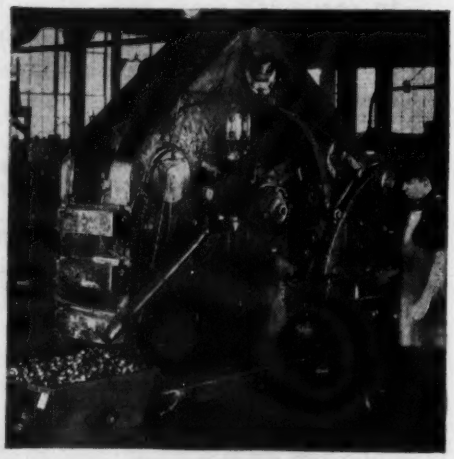
•

Union Cold Drawn and Ground Rounds; Turned and Polished Rounds; and Turned, Ground and Polished Rounds (Union Precision Shafting.)

LITTLE BOLTS DO BIG JOBS
for
Agriculture

NOWHERE has progress been more pronounced than in the development of farm machinery . . . equipment in which special type nuts and bolts play an increasingly important part. A good example of this is the unique tractor bolt illustrated above . . . produced by the Buffalo Bolt Company.

Circle Ⓑ nuts and bolts are noted for their uniform size and strength. No matter what your requirements, the controlled quality of all Circle Ⓑ products, standard or special, will enable you to improve your production efficiency and the stamina and reliability of the equipment you produce and sell.



Did you know that Buffalo Bolt Company has designed and built many highly efficient nut and bolt making machines, one of which is illustrated.

Ⓑ BUFFALO BOLT COMPANY

NORTH TONAWANDA, N. Y. • SALES OFFICES IN PRINCIPAL CITIES

Export Sales Office: Buffalo International Corp., 50 Church Street, New York City

ARM YOURSELF WITH COSMOLINE
. . . 9 proven rust preventives to cover all needs

Houghton began its fight on rust in 1869. Soon after it adopted "Cosmoline" as its trade name for rust preventives, and has held that banner high in the battle against corrosion down through the years.

Today, as a result of valiant aid given Uncle Sam in the form of inhibited oils, solvents and greases, we have selected nine of our best preventives to lead the peace-time fight. All of them were proved "under fire"; each has a use in industry's need to protect metal surfaces. Here they are:

COSMOLINE 915—Dry Film Removable (AXS-673)

COSMOLINE 110-D—Dry Film Non-Removable; clear resin varnish. (USA-3-182)

COSMOLINE "B"—Dry Film, waxy type.

COSMOLINE 915—Solvent type, light oil film (52C18 Gr. II)

COSMOLINE 266—Fingerprint Neutralizer; water-displacing.

COSMOLINE LIGHT—Inhibited SAE 10 oil (AXS-934 Gr. I)

COSMOLINE MEDIUM—Inhibited oil, Vis. 100-125 @ 210° F. (AN-VV-C-576 B, Type 1)

COSMOLINE HEAVY—For long-term storage.

COSMOLINE EXTRA HEAVY—Medium dark soft grease (AN-C-124)

For details and prices, write

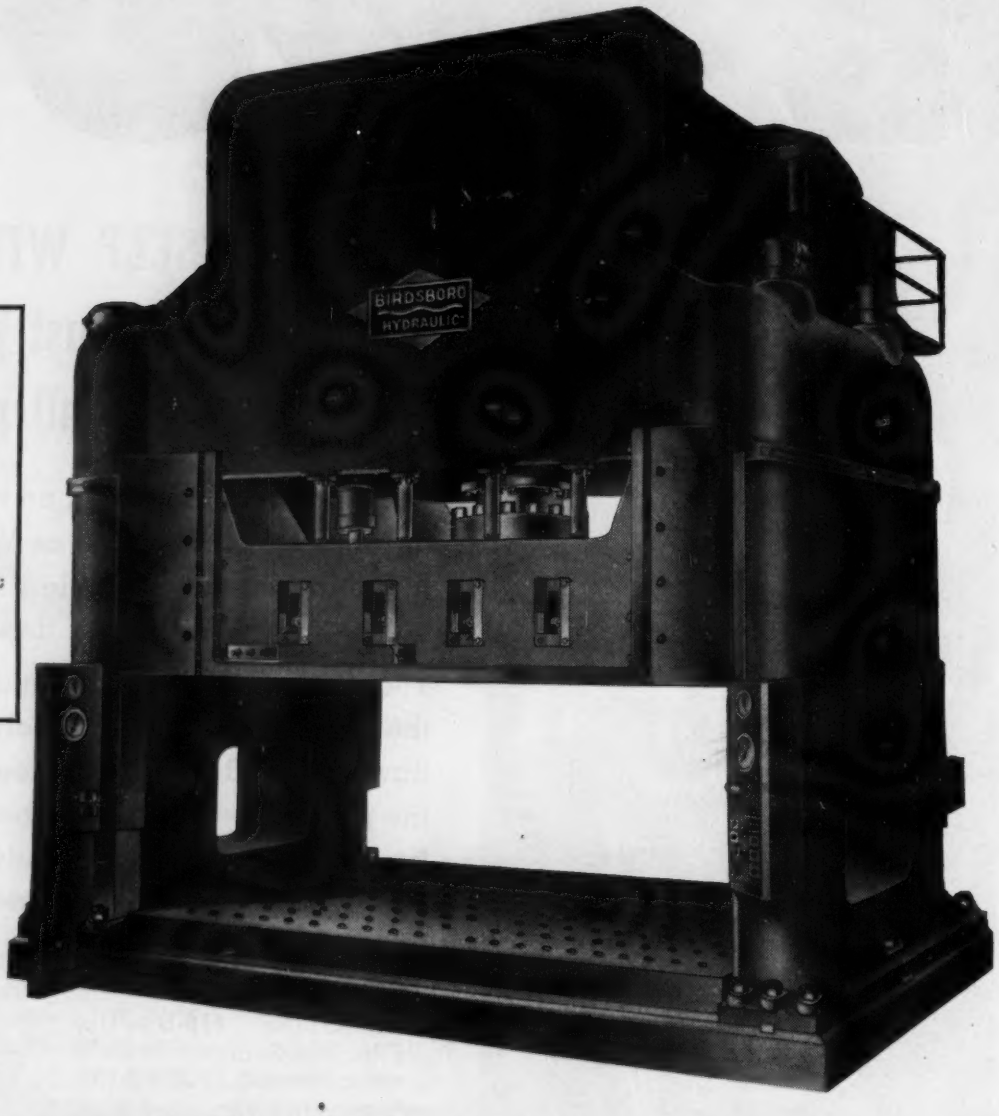
E. F. HOUGHTON & CO.

Philadelphia, Chicago, Detroit, San Francisco

NEW HYDRAULIC METAL STAMPING PRESS

This new Birdsboro press has been designed and engineered to incorporate many new features to produce metal stampings faster, more accurately, according to the most modern methods.

For more detailed information or for help in solving your press problems, call for a Birdsboro engineer today.



HYDRAULIC SINGLE ACTION DEEP DRAW SHEET METAL PRESS—HOUSING AND SHRUNK TIE ROD TYPE WITH HYDRO-PNEUMATIC CUSHION IN BED

- 500 ton main ram capacity
- 180 ton cushion capacity
- Working area: 144" right to left; 60" front to back
- Daylight opening—60"
- 125 H. P. motor
- 20' overall height above floor

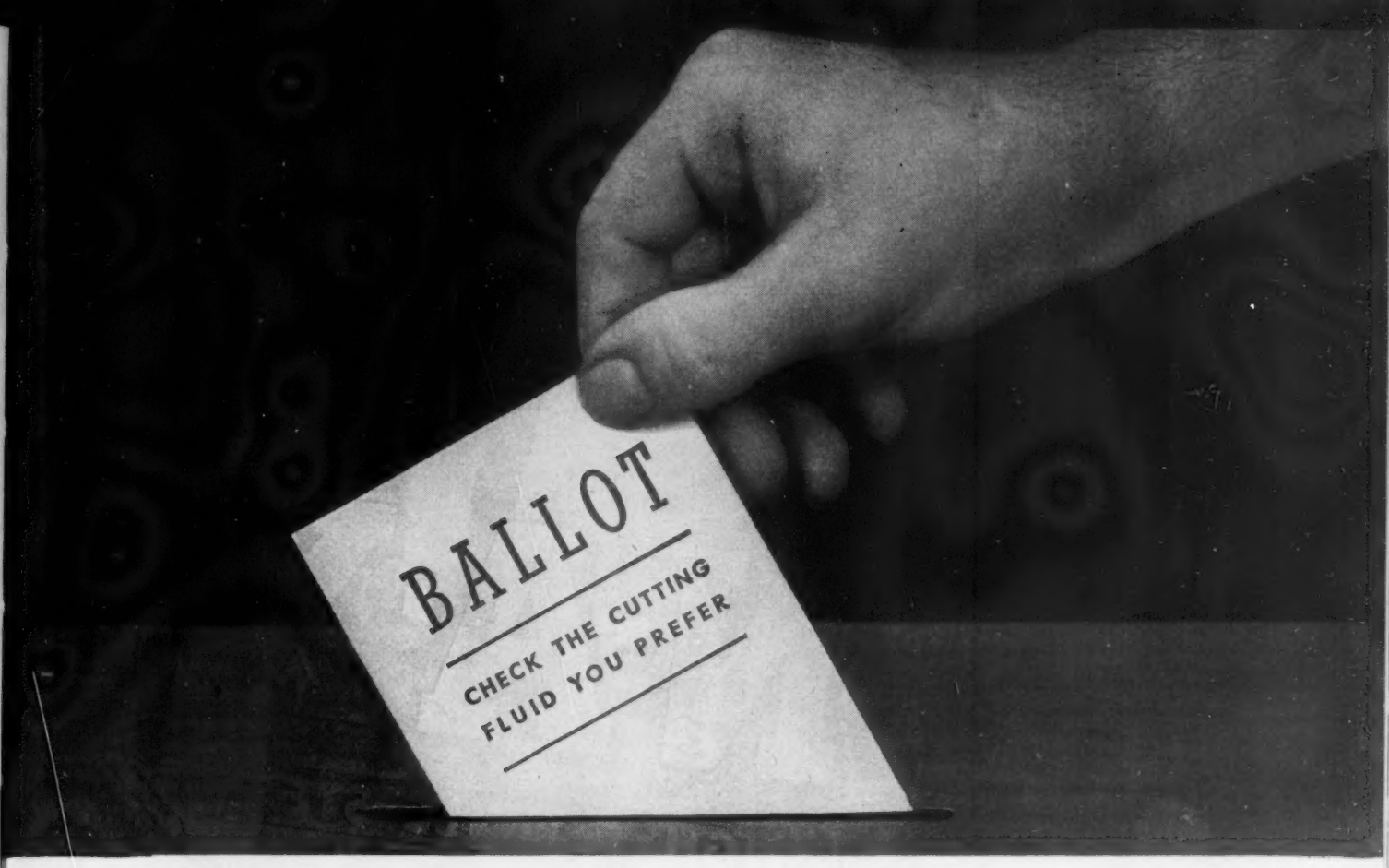
BIRDSBORO STEEL FOUNDRY AND MACHINE CO. • BIRDSBORO, PA.

Representatives in: Cincinnati, Ohio; Indianapolis, Indiana; Kansas City, Missouri; Oklahoma City, Oklahoma; Pittsburgh, Pennsylvania; and Tulsa, Oklahoma.

BUILDERS OF: Hydraulic Presses • Steel Mill Equipment • Rolls • Special Machinery • Crushing Machinery

BIRDSBORO

HYDRAULIC PRESSES



THE RESULT'S "IN THE BAG"

when operators vote!

Yes, Cimcool wins hands down with metal cutting operators. And no wonder! Just look at the platform it runs on (and lives up to).

1 It's clean—doesn't soil hands or clothes.

2 Can't smoke—causes no harmful vapors.

3 Produces no objectionable odors.

4 No slippery film on hands, machine, floor.

5 No chromates or other skin irritants.

6 Is not subject to rancidity.

7 Tools and chips actually stay cool to touch.

OTHER CIMCOOL ADVANTAGES

- Cimcool cools faster—allows faster cutting.
- Uniform work temperature increases accuracy.
- No fire hazard—Cimcool can't burn.
- Contains long-lasting rust inhibitor.
- Chemical lubricity increases tool life.
- Covers 85% of all metal working jobs.

CIMCOOL

THE MULTI-PURPOSE CUTTING FLUID

Cimcool Reg. U. S. Pat. Off.

CIMCOOL DIVISION of THE CINCINNATI MILLING MACHINE CO., CINCINNATI 9, OHIO, U. S. A.

This is no idle promise. It is a proved fact, demonstrated day after day in the production of widely varied parts and products. Three tons of N-A-X HIGH-TENSILE are yielding as many finished units as were previously yielded by *four* tons of carbon sheet steel.

This "new arithmetic in steel" is helping overcome steel shortages for scores of manufacturers. They are taking advantage of N-A-X HIGH-TENSILE'S greater strength and corrosion-resistance to reduce sections an average of 25%—and still provide greater strength and durability than can be obtained with thicker sections of mild-carbon steel.

At a time when America must make fullest use of its steel-producing capacities and conserve its natural resources, the trend to N-A-X HIGH-TENSILE has national significance. Each ton produced represents a potential 33% increase in finished goods. Each ton used enables the manufacturer to get 33% greater usefulness out of his steel supply.

Investigate the opportunity to make each ton of sheet steel go farther—through the superior quality of N-A-X HIGH-TENSILE.

GREAT LAKES STEEL CORPORATION

N-A-X ALLOY DIVISION, DETROIT 18, MICHIGAN • UNIT OF NATIONAL STEEL CORPORATION

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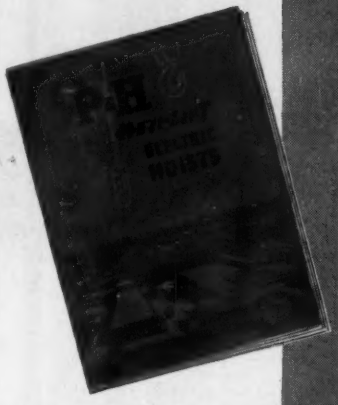


Here's everything you want to know about P&H Hevi-Lifts . . . applications, pictures, specifications. It's Bulletin H5-1 — yours for the asking.

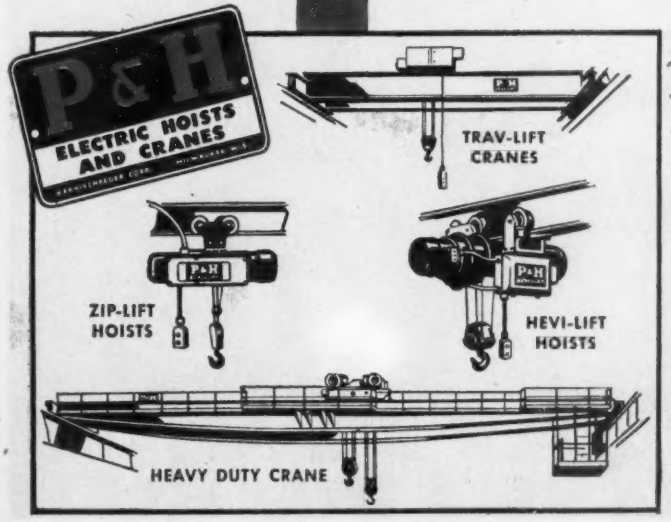
YOU DON'T PAY FOR REHANDLING

when you move loads "THRU-THE-AIR!"

That's where you make the big saving! From the time your loads are picked up, until they're "spotted" into place, you have no rehandling at all. No "muscling" before and after . . . your P&H Hevi-Lift Hoist does *all* the work, quickly, effortlessly.

- Think of the time and energy saved!

Skilled hands are never kept waiting, never tired by needless work — push buttons do it all! The P&H Hevi-Lift, with capacities up to 15 tons, brings every advantage of "thru-the-air" handling to all types of plants. For advice on your specific needs, consult a P&H Hoist Engineer . . . or see bulletin at left.



The "Extras" Are STANDARD EQUIPMENT, Added Values on P&H Hevi-Lift Hoists

- Shaved gears for lifetime service . . . all bearings grease-sealed.
- Thermal overload protection against motor burn-outs . . . twin brakes for extra safety.
- Motors specifically designed and built by P&H for hoist service — high starting torque, frequent reversals, etc.
- Effortless push-button control . . . available for all motions and with variable speed feature.
- Transformer provides 110 volts at push-button.
- P&H's true motor ratings assure against failure at full capacity loads and speeds.

P&H ELECTRIC HOISTS

4411 West National Avenue

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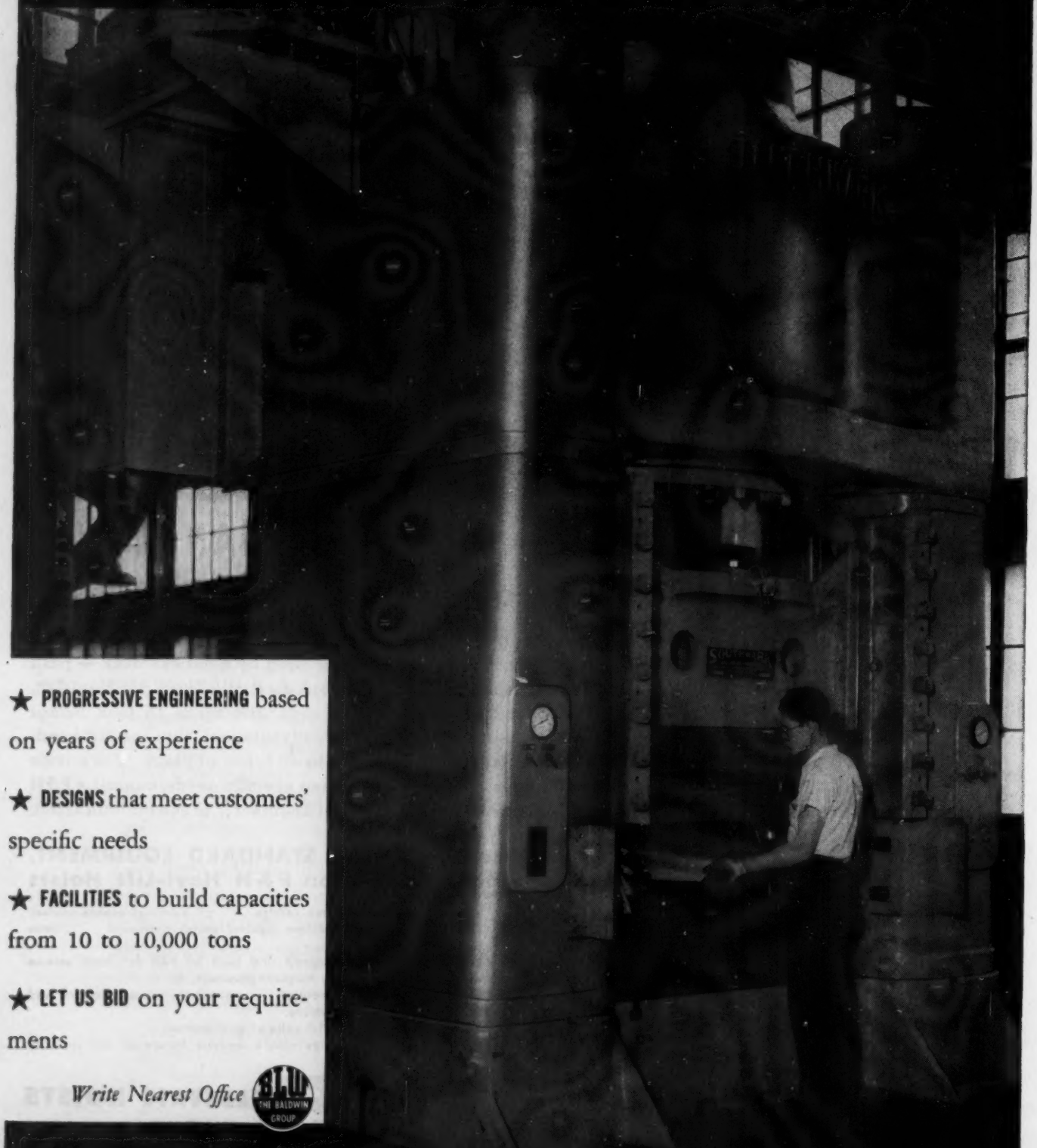
HARNISCHFEGER CORPORATION

HOISTS • WELDING ELECTRODES • MOTORS P&H EXCAVATORS • ELECTRIC CRANES • ARC WELDERS

BALDWIN

SOUTHWARK

HYDRAULIC PRESSES



★ **PROGRESSIVE ENGINEERING** based on years of experience

★ **DESIGNS** that meet customers' specific needs

★ **FACILITIES** to build capacities from 10 to 10,000 tons

★ **LET US BID** on your requirements

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THE BALDWIN LOCOMOTIVE WORKS, PHILADELPHIA 42, PA., U. S. A. OFFICES: BOSTON, NEW YORK, PHILADELPHIA, BIRMINGHAM, HOUSTON, ST. LOUIS, CHICAGO, CLEVELAND, SEATTLE, SAN FRANCISCO, WASHINGTON, PITTSBURGH, DETROIT

Cold Facts...

...ON LUBRICANT PERFORMANCE

This special refrigerating apparatus at Sinclair Laboratories tells an important story every day to research experts and refinery control technicians.

The thermometers, shown above inserted in lubricating oil samples, record temperature as cold is increased in the special refrigerating apparatus. Trained observers check the samples frequently, test for pour point. Sinclair, thus, makes sure that its lubricants retain full protective qualities even at sub-zero temperatures . . . when your specific application demands.

Such constant manufacturing control and research assures you that famous Sinclair lubricants . . . and all new Sinclair products . . . will give outstanding performance to meet your most exacting requirements.

Sinclair Metal Working Oils

For General Alloy Steels:
WILKUT OILS

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For Water Emulsions:
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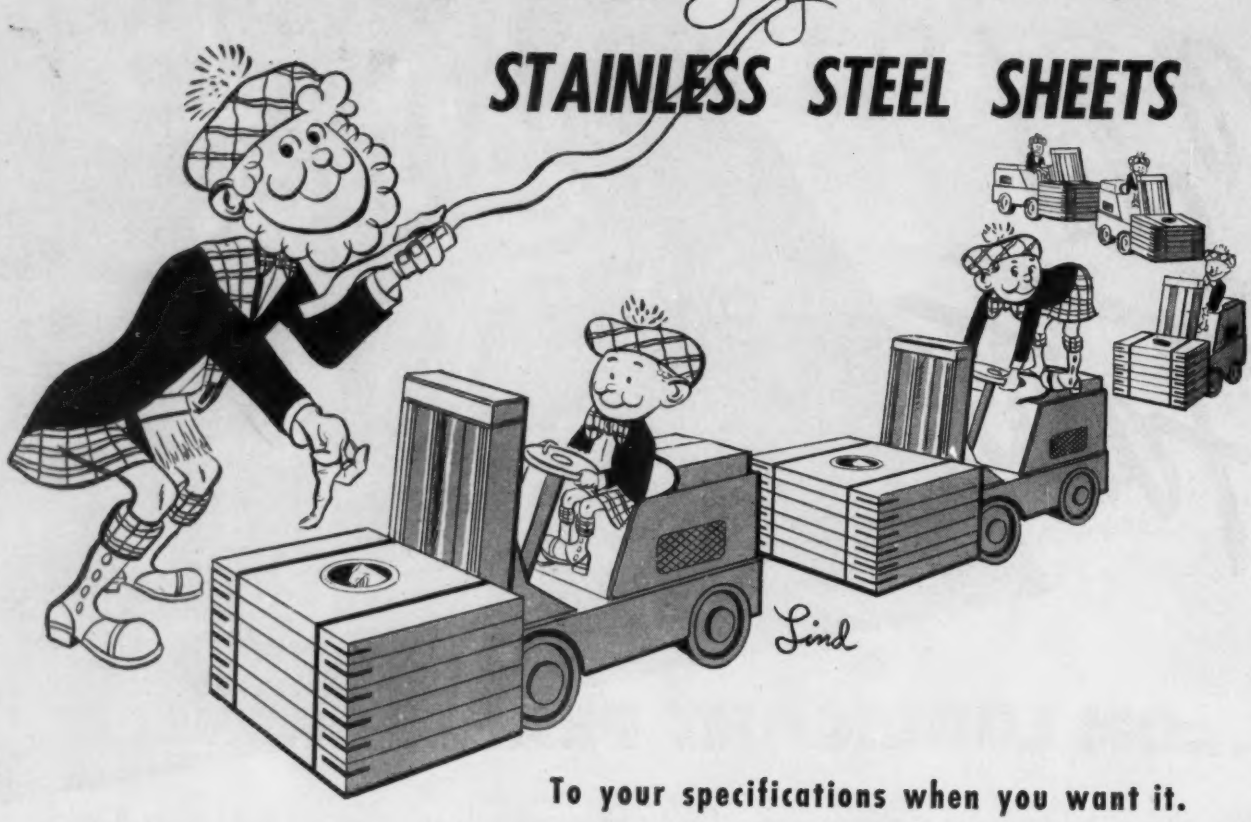
Lubricants for Industry

FINEST CRUDES + EXPERT RESEARCH and MANUFACTURING CONTROL = OUTSTANDING PERFORMANCE

We're Delivering *Lighter* Gauge STAINLESS STEEL SHEETS



To your specifications when you want it.

The Washington Steel Corporation is able to supply fabricators with a constant flow of *MicroRold* Stainless Steel Sheets, Type 302 or 304 in a range from 24 to 30 gauge by 36 inches wide by any length.

Many fabricators have specified certain gauges which may be heavier than is actually needed. Now, because of improved cold rolling mill equipment, manufacturers may specify *MicroRold* cold rolled sheet in the actual gauge required for a specific job and be assured of getting a product with virtually no crown and held to a tolerance of plus or minus .001" of the specification. The "no crown" feature of *MicroRold* Stainless Steel and overall accuracy of gauge means economies as more area or parts per ton of material is realized.*

From regular users now polishing their sheets, we are told that output per ton is often more than doubled.

If we can be of service or if further information is needed, we hope you will call one of Washington Steel's representatives or direct your inquiry to the mill.

*Example of 21% saving

.012" × 36" × 96" = 24 sq. ft. = 12# @ 62.25¢ lb. = $7.47 = 31.00¢ sq. ft.
.024" × 36" × 96" = 24 sq. ft. = 24# @ 39.50¢ lb. = $9.38 = 39.50¢ sq. ft.

MicroRold STAINLESS STEEL MEANS

Remarkable Accuracy of Gauge
More Area or Parts per ton
Consistant Physical Properties
More Dense Surface Structure
Easier and Less Expensive to Polish

WASHINGTON STEEL CORPORATION
WASHINGTON, PENNSYLVANIA

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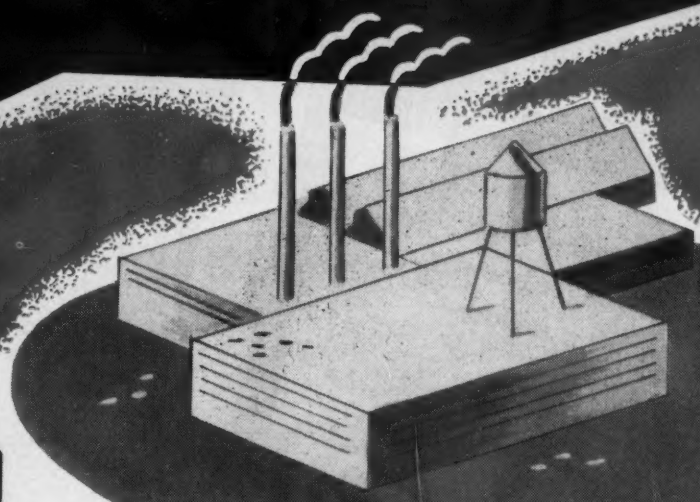
WASHINGTON STEEL CORPORATION — MicroRold — STAINLESS SHEET & STRIP

WITH AN EYE ON PRODUCTION *Costs*

AND PRODUCTION *Volume*



OXYGEN COUPLING

ACETYLENE COUPLING

HANSEN COUPLINGS

SAVE TIME...CUT COSTS

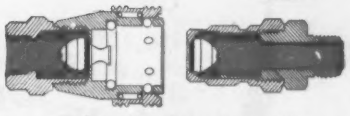
It's the minutes saved on operations repeated many times daily that mount up to substantial savings in time...and money. With Hansen Couplings, connections and change-overs become a matter of seconds with no hold-up of costly operations.

To connect a Hansen coupling, you merely push plug into socket. To disconnect, slide sleeve back with thumb. In both cases, flow is immediately and automatically turned on or off . . . with no time wasted, no losses.

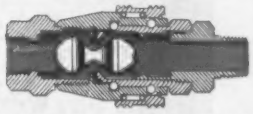
There is a specific Hansen coupling, made for air, oil or grease, for oxygen, and for acetylene. Available in a wide range of standard sizes.

Write for catalog describing full line of Hansen couplings and fittings for industrial use.

The Hansen Two-Way, Shut-Off Coupling.



Red section shows how rubber washer in valve stem contacts valve seat in both plug and socket, sealing both plug and socket against leakage instantly.



Red section shows flow of liquid or gas around spool section of valve, permitting free flow of liquid or gas through coupling instantly upon connection.

REPRESENTATIVES

New England States:
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B-R ENGRG. CO., Baltimore, Md.

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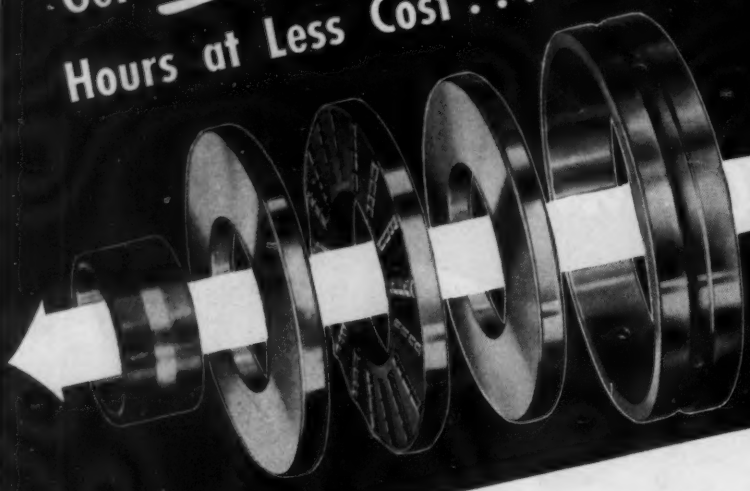
Get More Man and Machine Hours at Less Cost . . .

ROLLWAY *Right-Angle-Loaded* BEARINGS



Right-angle loading actually means fewer shut-downs...lower maintenance costs...longer hours of machine operation with fewer bearing replace-ments. These features prove it:—

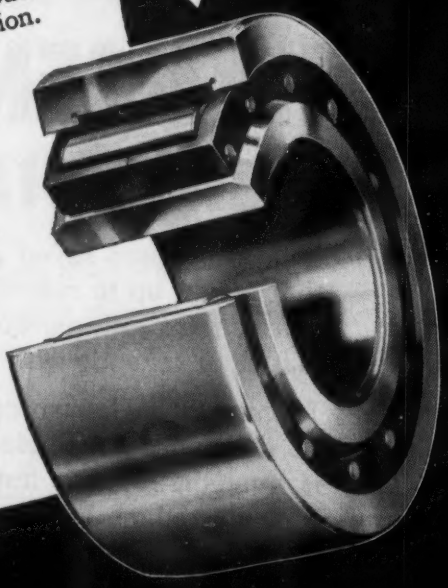
1. Rollway Right-Angle-Loaded Bearings carry all loads at right angle to the roller axis. Hence, they are subjected only to pure thrust or pure radial loads. Compound loads . . . oblique loads and their resultants . . . are not brought to bear on a single bearing.

2. Right-angle loading prevents wedging of rollers and pinch-out. Greatly reduces roller end-rub . . . wear-back and rubbing friction.

3. Permits greater radial or thrust load-carrying capacity in any given dimension.

4. Assures solid cylindrical rollers of greater roller mass and uniform roller cross-section.

5. Assures greater resistance to shock loads and vibration . . . longer life expectancy under continuous heavy-duty service.



ROLLWAY BEARING COMPANY, INC., SYRACUSE, N. Y.

SALES OFFICES

Philadelphia, Boston, Minneapolis, Pittsburgh, Houston, Cleveland, Los Angeles, Detroit, Chicago

FREE SERVICE! Send us a print or detailed statement of your bearing problems. Our engineers will make an analysis and recommend the exactly right bearing for your particular needs.

ROLLWAY BEARINGS

WHY FABRICATORS LIKE YOLOY - YOUNGSTOWN'S HIGH-TENSILE STEEL

YOLOY has been specified for many tough jobs--such as the National Advisory Committee for Aeronautics wind tunnel at Cleveland, Ohio--because of its remarkable ability to resist shock, or impact at low temperatures.

In order to determine the impact value of Yoloy steels a "standard" notched bar is broken by a single blow on a pendulum type impact machine, at ordinary temperatures or at some specified temperature, and the energy required to break the bar is determined in foot pounds. The values obtained are comparative and provide useful information for the design engineer. Most steels increase their Tensile Strength and lose ductility as the temperature is lowered. Yoloy retains its resistance to impact to a greater degree than carbon steels at various temperatures.

Ability to resist shock at low temperatures is only one of several valuable characteristics of Yoloy steels--properties that are the outgrowth of 12 years' experience in satisfying the complex requirements of customers. If you need a steel that has high impact strength or extra tensile strength, one with unusual ability to resist corrosion and abrasion, one that is easy to form and easy to weld, specify Yoloy. Ask the District Sales Office that serves you for full details.

Sheets-Plates-Pipe and Tubular Products - Bars - Rods - Wire - Cold Drawn Carbon Steel Rounds-Tie Plates and Spikes- Conduit-Electrolytic Tin Plate-Coke Tin Plate.

QUALITY TRADE MARK YOUNGSTOWN SERVICE

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THE YOUNGSTOWN SHEET AND TUBE COMPANY

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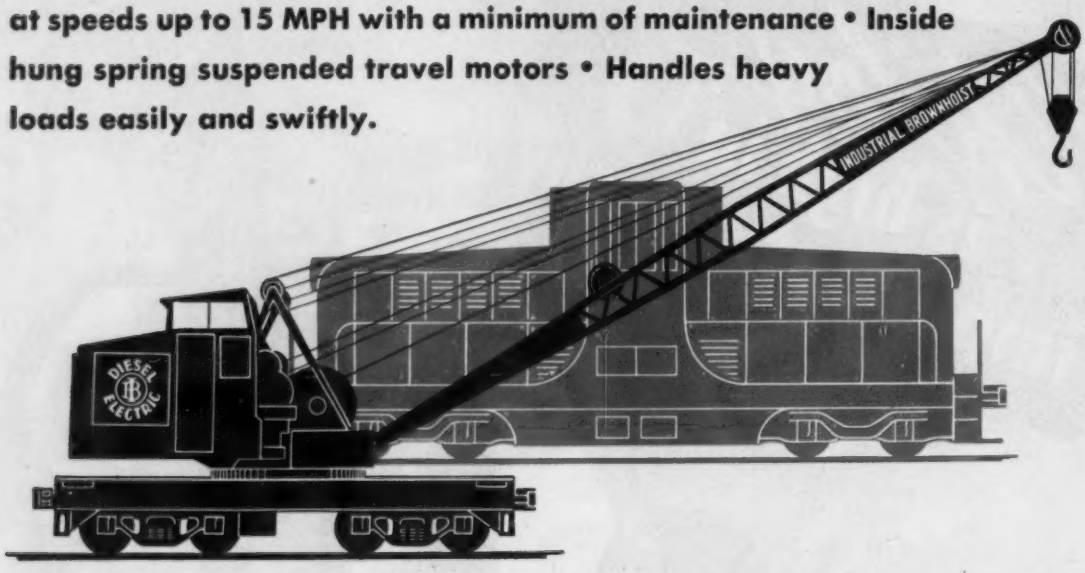
Manufacturers of

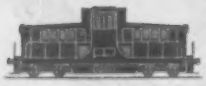
CARBON - ALLOY AND YOLOY STEELS

NOW AVAILABLE . . . BROWNHOIST DIESEL-ELECTRIC LOCOMOTIVE CRANE

(PATENT APPLIED FOR)

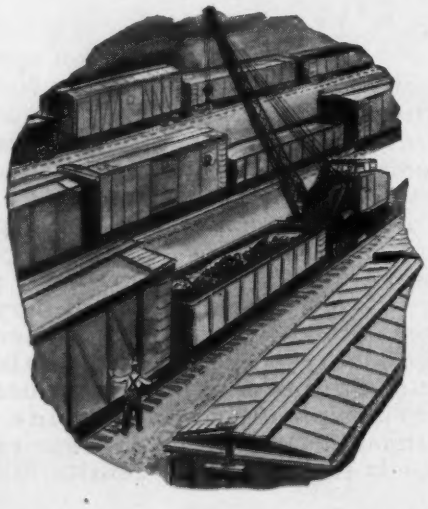
Versatile new BROWNHOIST CRANE doubles as switch engine • Travels at speeds up to 15 MPH with a minimum of maintenance • Inside hung spring suspended travel motors • Handles heavy loads easily and swiftly.



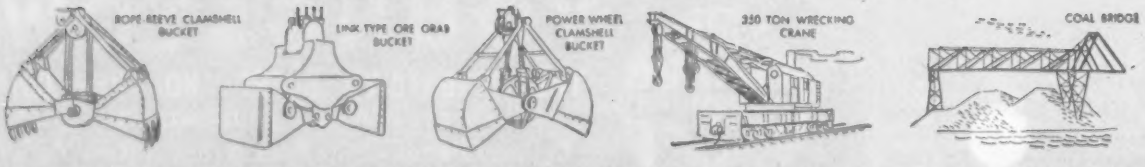


You get *double duty* from the new Brownhoist Diesel-Electric Locomotive crane . . . a heavy duty switch engine that *operates at minimum cost!* A powerful, rugged unit built to absorb shock and strain day after day. Switching in your yards with low fuel and maintenance costs. No soot or coal dust. Rapid acceleration. Electric swing available at additional cost. You get all this plus . . .

Low-cost CRANE operation. The patented monitor-type cab with its 360° visibility assuring greater safety, less operator fatigue, more materials handled per man hour. *Other safety features* include worm-driven boom-hoist and 14" clearance between car body and revolving upperworks. In the new Brownhoist Diesel-Electric crane you get all the many engineering and construction advantages that have made Brownhoist cranes the top choice in industry. *Write now for complete particulars* about this up-to-the-minute crane and car-switching unit.



BROWNHOIST BUILDS BETTER CRANES



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DISTRICT OFFICES: NEW YORK, PHILADELPHIA, CLEVELAND, CHICAGO • AGENCIES: DETROIT, BIRMINGHAM, HOUSTON, DENVER, LOS ANGELES, SAN FRANCISCO, SEATTLE, VANCOUVER, B. C., WINNIPEG, CANADIAN BROWNHOIST LTD., MONTREAL, QUEBEC.

HOW TO KNOCK TOUGH PROBLEMS FOR A LOOP

Another top performance by a BWH product

When heavy, highly abrasive magnetite ore had to be whisked from hopper to hopper for refining, a leading foundry found BWH Bull Dog Ore Handling Hose the answer to a lot of tough problems.

This hose, while highly flexible, is also amazingly durable. Multiple plies of heavy duck are wound over a tough one-inch-thick rubber lining. Beneath the two outer plies is a high tensile spiral wire embedded in high-quality rubber.

Spaced to give the hose maximum flexibility, this wire also adds strength and prevents kinking.

Finally, a high-grade, age-resistant rugged rubber cover encloses both tube and carcass. Fittings are of the outside sleeve type, which means no metal has a chance to come in contact with the abrasive ore, and service of the hose is therefore greatly prolonged.

With this BWH Ore Handling Hose on the job, ore and waste sand were efficiently separated in a low-cost, trouble-free operation.

Bull Dog Ore Handling Hose is just one of the many quality products manufactured by BWH. Whenever you require this or other types of industrial rubber goods, look to BWH for dependable ruggedness . . . and to BWH distributors for dependable service.

HAVE YOU A PROBLEM WHERE STAMINA COUNTS?

Bring us your toughest problems . . . we're specialists in solving them. Consult your nearest BWH distributor, or write direct.

Another Quality Product of

BOSTON WOVEN HOSE & RUBBER COMPANY

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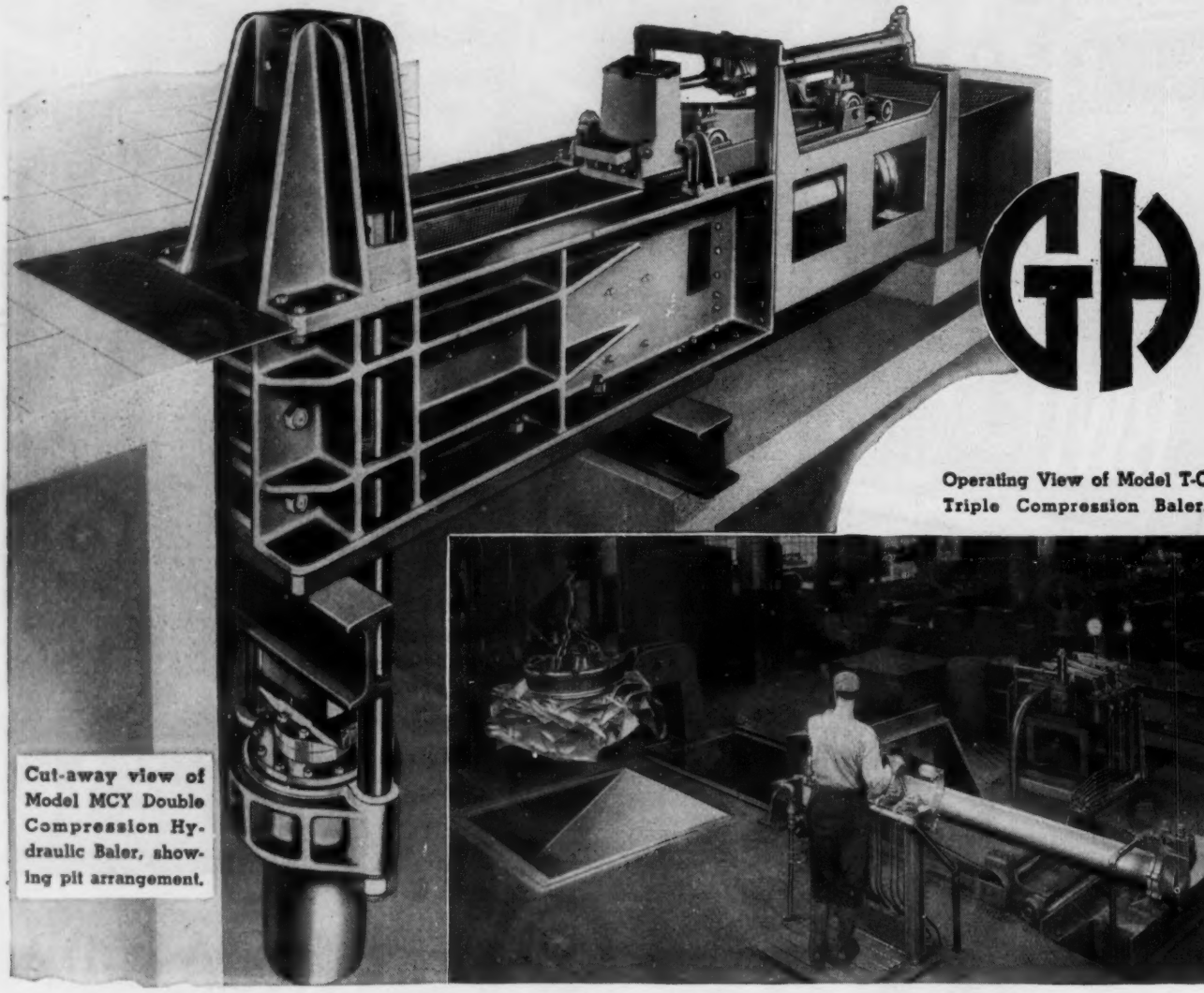
MAKE GALLAND-HENNING YOUR HEADQUARTERS FOR SCRAP BALING COUNSEL



Operating View of Model T-C Triple Compression Baler.

Cut-away view of Model MCY Double Compression Hydraulic Baler, showing pit arrangement.

Plan *Future* BALING Needs *NOW*.....

The demand for increased production of iron, steel and non-ferrous metals continues to grow as metal-working activities expand. This trend is expected to continue. With it, the demand for scrap metal is exceeding all previous requirements. One of the most desirable forms of scrap is Baled Sheet Metal Scrap, correctly sized and classified. Why? Because it can be used to charge furnaces or cupolas without costly extra handling or loss of heat.

If you are not baling your sheet metal scrap at present, perhaps you should consider the idea ... not only for the direct benefits to your own operations ... but to maintain and increase the productive capacity of our mills, smelters and foundries ... by speeding up "the Scrap Cycle."

NOW is the time to anticipate future baling needs ... to choose Baling Press Equipment engineered, constructed and installed to serve you adequately through the years ahead. Galland-Henning offers you such equipment ... plus the benefit of many years experience in the successful solution of scrap baling problems. Write —

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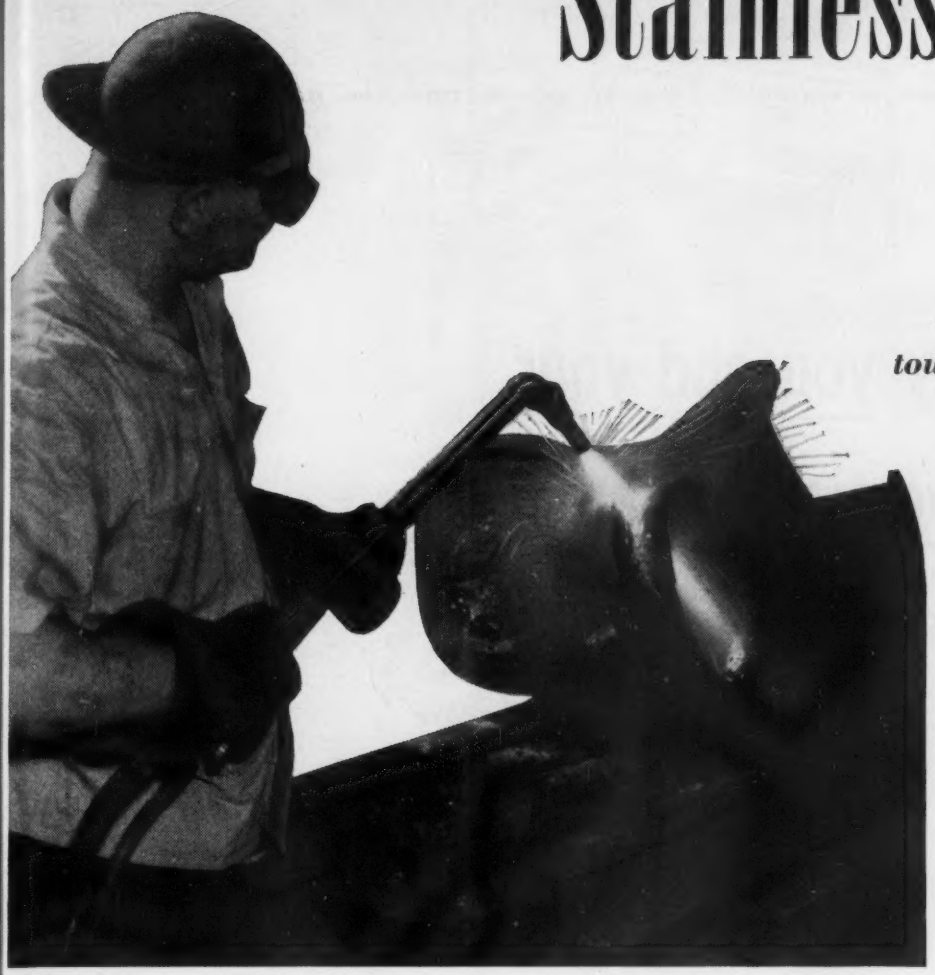
2747 S. 31st STREET, MILWAUKEE 7, WISCONSIN

GALLAND-HENNING
SCRAP METAL BALING PRESSES

A 5294-1P

Stainless Steel is TOUGH



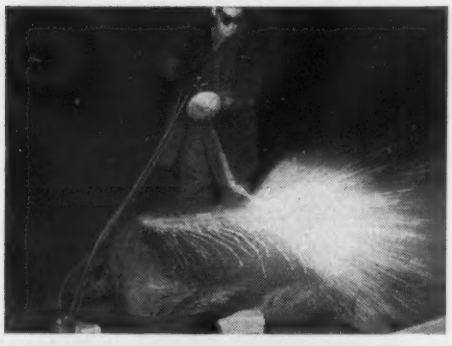
tough to cut, too—but LINDE makes the job easier . . . just as easy as cutting carbon steel

LINDE's powder-cutting process overcomes the barrier to fast and economical cutting of stainless or chromium steels.

By means of easily installed attachments for standard oxy-acetylene equipment, powder-cutting can be done without substantial change from carbon steel cutting techniques.

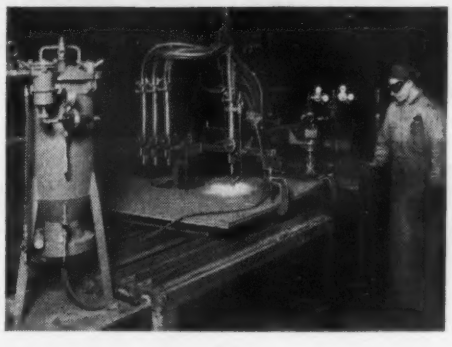
IN FOUNDRIES—

by powder-cutting, risers are removed 20 times faster than by older methods. Removal of riser pads and gouging out defects can be done at considerable savings in cost.



IN STEEL MILLS—

a 12,000-lb. ingot can be powder-scarfed in 4 to 6 hours—about 1/10 the time required for grinding. Sizing of ingots, billets, and slabs, removal of hot tops, scrapping operations, and many other cutting jobs can be done in a fraction of the time previously required.



IN FABRICATING PLANTS—

a stack of twelve 10-ga., type-304 stainless sheets were powder-cut at 8 in. per min. . . . 4-in. I.D. by 8-in. O.D. flanges on ½ in., type 316 plates were made in 2 minutes of cutting time apiece.

If you work with stainless steel you will want to know more about this LINDE process. LINDE can supply the equipment you need, help you to set up, and supply the training help you need.

Linde

The word "Linde" is a registered trade-mark of The Linde Air Products Company.

THE LINDE AIR PRODUCTS COMPANY

Unit of Union Carbide and Carbon Corporation

30 East 42nd St., New York 17, N. Y. UCC Offices in Other Principal Cities

In Canada: DOMINION OXYGEN COMPANY, LIMITED, Toronto

One of a series *of messages to help you increase your understanding of business paper advertising, and its effect on your business.*

Why you and your advertising manager are partners

FROM WHERE YOU SIT, advertising may look like the "glamour department" of your company—necessary, of course, but pretty far removed from the hard-headed realities of the production line.

But take a closer look. In one respect, the advertising manager's job bears a striking resemblance to your own.

You're production-minded. You're concerned with anything that will improve plant procedures, speed up assembly time, prevent waste, and reduce the manufacturing cost per unit.

And that is precisely where you walk arm-in-arm with your advertising manager. Because he thinks the same way about the *manufacture of a sale.*

The whole process of selling and distribution are his assembly line. And every time he can reduce the unit cost of a sale by so much as a few cents, he increases your company's chance to show a profit.

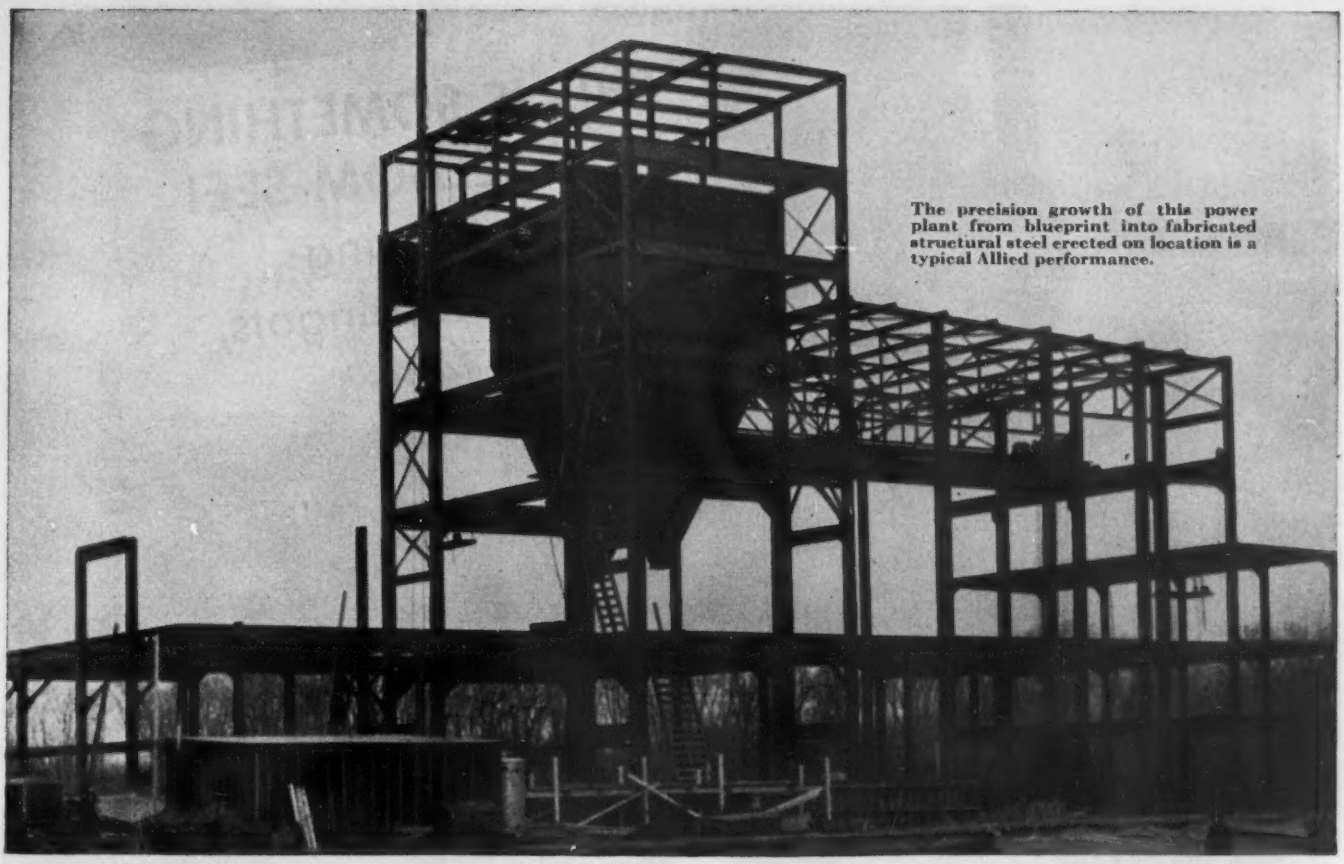
Ask him for a definition of advertising, and he will probably tell you that it is simply *mechanized selling*, a machine that multiplies the productive capacity of the sales force — seeking out prospects, arousing their interest, creating a preference for the things your company makes.

And when it is concentrated among the hand-picked readers of business papers, advertising becomes the most efficient machine this partner of yours has found for lowering the cost of producing a sale.

What are the ten ways to measure the results of your business paper advertising? You'll find the answers in a recent ABP folder, which we'll be glad to send you on request. Also, if you'd like reprints of this advertisement (or the entire series) to show to others in your organization, you may have them for the asking.

STEEL

is one of the 129 members of The Associated Business Papers, whose chief purpose is to maintain the highest standards of editorial helpfulness—for the benefit of reader and advertiser alike.



The precision growth of this power plant from blueprint into fabricated structural steel erected on location is a typical Allied performance.

Power Plant and Water Works Plans and Specs are Perfectly Familiar to Our Engineers and Estimators

Many a steel sinew born at Allied finds perfect co-ordination in a power plant or water works structure. Allied meets today's challenge . . . quick interpretation of plans into cold steel . . . for buildings, bridges, ships, or stadiums . . . equally well.

3 plants operating as one fabricate the structural steel with speed and precision

Each plant is a completely equipped unit, operating under centralized control. If there's a regional slowdown in Plant 1, a job can be moved quickly to identical equipment in Plants 2 or 3. Bottlenecks are unusual here.

To get jobs off to a fast start, the engineering staffs of the 3 plants have now united in the office. They've pooled their years of experience, their knowledge of war-tested precision shortcuts in fabrication and erection. Under their well laid plans, the wheels of Allied's multiplicity of equipment are constantly turning to solve new, intricate problems in steel or aluminum; riveting or welding. The staff is readily available for consultation on *your* problems.

. . . and erection on the site goes up on time

To fabricate steel and aluminum for due date delivery is *one* achievement these days; to have a structure up on the promised date is *another.* Allied's reputation on both counts . . . is enviable.

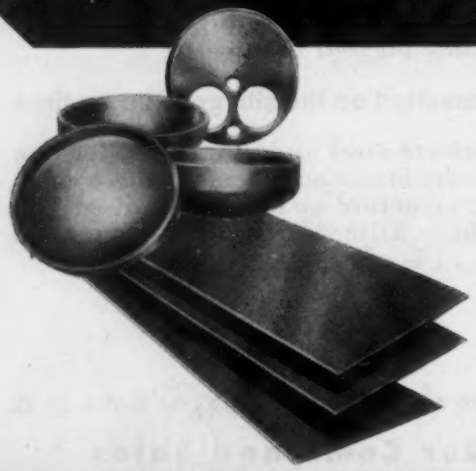
ALLIED STRUCTURAL STEEL COMPANIES

ENGINEERS • FABRICATORS • ERECTORS

COMBINED SALES ENGINEERING DEPARTMENT
OPERA BUILDING, 20 NORTH WACKER DRIVE, CHICAGO, ILL.

Plants: Clinton Bridge Works, Clinton, Ia., Gage Structural Steel Co., Chicago, Ill., Midland Structural Steel Co., Cicero, Ill.

Send All Inquiries
To Our Combined Sales Engineering Department
20 N. Wacker Drive, Chicago, Ill.



Bottom poured ingots are, of course, not "exclusively" a Worth innovation, but our experience of more than a half century conclusively proves that there is *no better way* to produce a clean, uniform ingot. Bottom-poured ingots are "merely one" of the many careful, proven procedures taken by Worth to assure fine quality Steel Plate.

Steel Plates up to 150" wide — Flanged and Dished Heads from 9½" to 216" O. D., in thicknesses from 3/16" to 4".

STEEL PLATES; FLANGED AND DISHED HEADS

WORTH

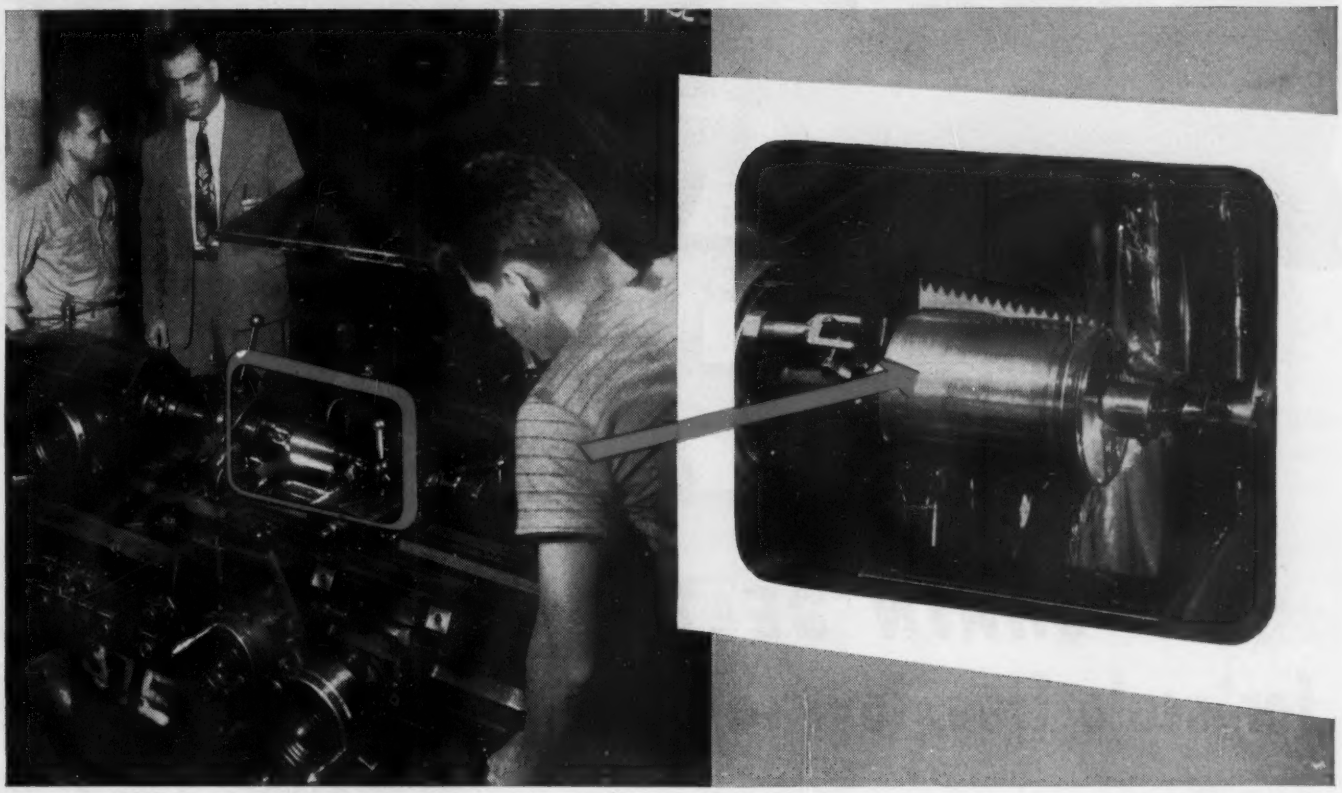
WORTH STEEL COMPANY · Claymont, Delaware

"We get better threads with

GULF THREAD GRINDING OIL

--and greater operator acceptance"

says the management of this modern shop



The Foreman (left) consults with a Gulf Lubrication Engineer on the performance of Gulf Thread Grinding Oil on special setup for grinding thread gauges. (Photos courtesy of Allen Gauge & Tool Company, Pittsburgh, Pa.)

—"objectionable odor and skin irritations eliminated"

"GULF THREAD GRINDING OIL is doing an outstanding job for us," says the management of this shop. "We're not only getting better threads, but also greater production and fewer rejects on our precision gauges."

"Just as important to us is the fact that our operators prefer Gulf Thread Grinding Oil. They like it because it has no objectionable odor, does not irritate the skin, and does not mist."

Specially developed by Gulf technologists for use on automatic thread grinding machines, Gulf Thread Grinding Oil combines the qualities you need to do a faster, more accurate thread grinding job. This quality product has superior lubricating and cooling qualities, gives effective protection against rust, has no objectionable odor, is nontoxic, and nonfoaming.

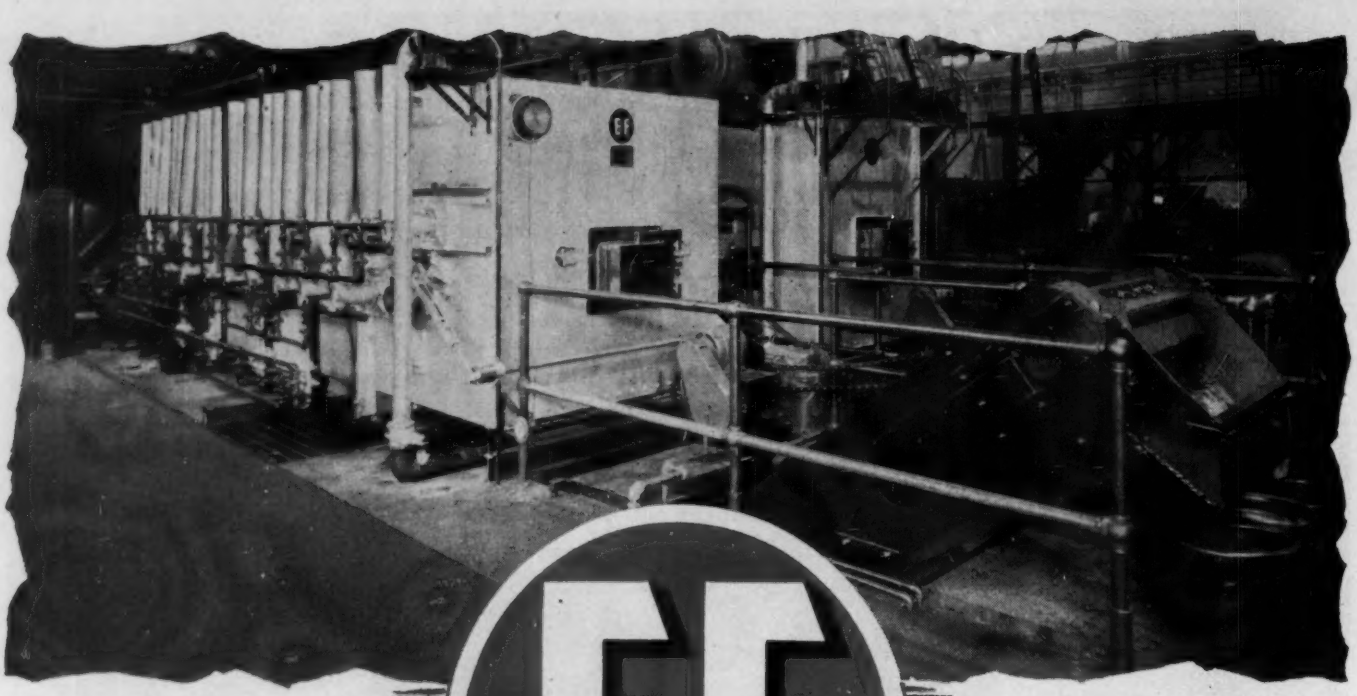
Call in a Gulf Lubrication Engineer today and ask him to demonstrate conclusively how Gulf Thread Grinding Oil can help you improve production and thread quality. Write, wire, or phone your nearest Gulf office.

GULF OIL CORPORATION · GULF REFINING COMPANY

Division Sales Offices:

Boston · New York · Philadelphia · Pittsburgh · Atlanta
New Orleans · Houston · Louisville · Toledo

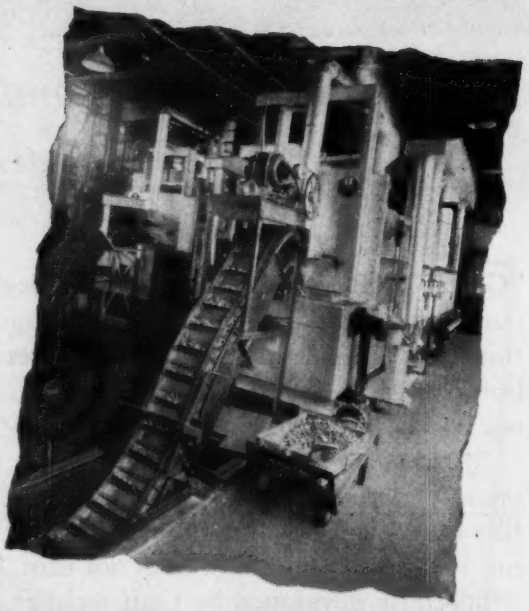
GULF INDUSTRIAL LUBRICATION



CHAIN BELT FURNACES

for scale free, low cost small parts hardening

● EF continuous chain belt conveyor type furnaces are unexcelled for the low cost, continuous heat treatment of small and medium sized parts ranging from springs, bolts, nuts and cap screws to tractor and automobile parts, gears, hand tools and similar products. The material to be treated is loaded directly onto the cast link heat resisting belt, is carried into the furnace automatically, uniformly heated to the proper temperature, quenched and discharged. These furnaces are available in gas fired, oil fired and electric types, in 11 standard sizes. Each is readily adapted for use with special protective atmospheres, for heat treating and hardening without scaling or decarburization. But send for our 12 page Bulletin No. R-1—"Chain Belt Conveyor Furnaces"—and let EF engineers, with their long and successful experience, work with you on your next heat treating job.

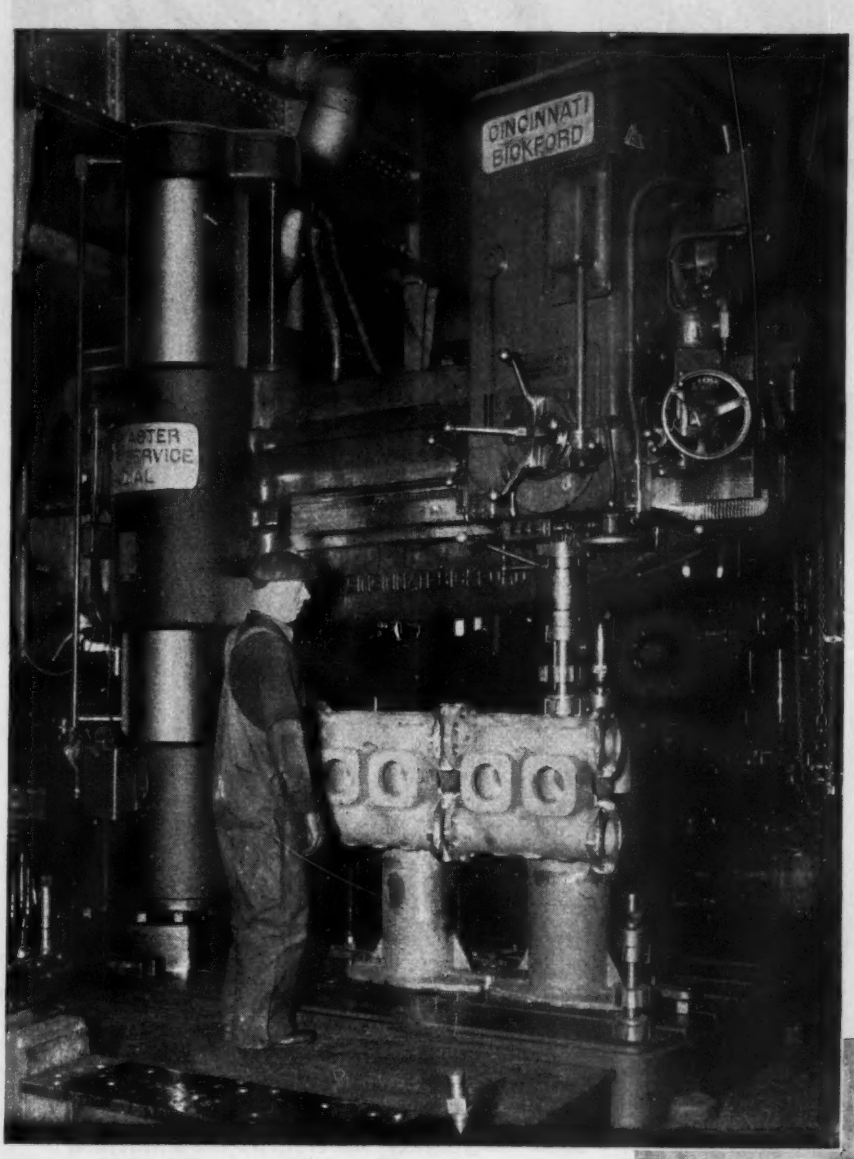


THE ELECTRIC FURNACE CO.

GAS FIRED, OIL FIRED AND ELECTRIC FURNACES
FOR ANY PROCESS, PRODUCT OR PRODUCTION

WILSON ST. AT PENNA. R.R.
Salem-Ohio

THE master OF THE JOB ...



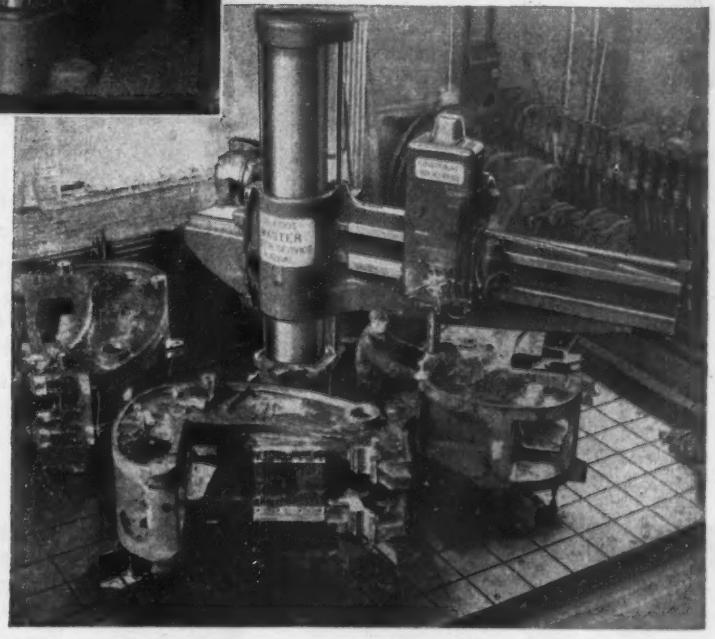
For the really big job, Cincinnati Bickford Master Super Service Radial Drills—the largest and most powerful radial drills built—give outstanding service.

Forty horse power, constant speed driving motor—spindle speeds from 12 to 1200 r.p.m., or from 6 to 600 r.p.m., insure efficient drilling or boring of holes from ¼" to 16" in diameter.

Very large, heavy castings are handled on these Master Super Service Drills—with their 7' to 12' arm and their 22" to 26" diameter columns. The operator controls these massive Radial Drills with ease—all operating levers being centralized low on the head.

o

If your job requires unusual power, rigidity and capacity in the machine, write for Circular R-22 on the Cincinnati Master Super Service Radial Drills—the masters of the job.



RADIAL AND UPRIGHT SUPER SERVICE DRILLING MACHINES

Equal Efficiency of Every Unit
Makes the Balanced Machine

THE CINCINNATI BICKFORD TOOL CO. Cincinnati 9. Ohio U.S.A.

Steel-Weld FABRICATION

Shown Here is a Large Base for a Progressive Automatic Machine, and a Slide for a Mechanical Power Press.

Your welded steel requirements may be something entirely different from the Machine Bases illustrated here . . . but, regardless of design, shape, size, or weight, the Mahon organization stands ready to handle your particular requirements promptly and efficiently. Complete and modern facilities for Cutting, Forming, Welding, Normalizing, Stress Analysis, Sandblasting, Machining and Painting make for economy in production, and a staff of thoroughly competent design engineers and highly skilled workmen are your assurance of every advantage of Steel-Weld Fabrication.

Address STEEL-WELD DIVISION

THE R. C. MAHON COMPANY

DETROIT 11, MICHIGAN

Engineers and Fabricators of Welded Steel Machine Bases and Frames, and Many Other Welded Steel Products

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Applications of Carbon Restoration
Blast Furnace Carbon Hearths
Latest Metallurgy Developments

STEEL

The Magazine of Metalworking and Metalproducing

VOL. 121, NO. 19 NOVEMBER 10, 1947

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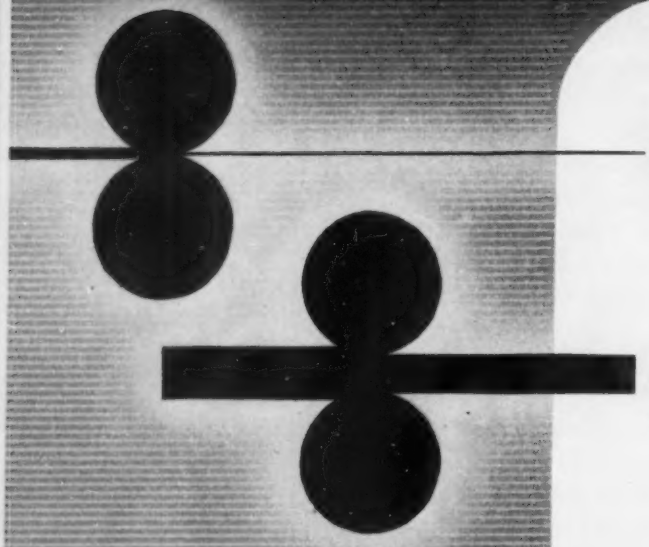
MORGOIL
ROLL NECK BEARINGS



for rolling the thinnest foil

or the thickest slab

Morgoils' versatility, capacity, accuracy, dependability and operating economy make them the preferred bearings in the field regardless of the products rolled.

MORGAN CONSTRUCTION COMPANY
WORCESTER, MASSACHUSETTS

English Representative:
International Construction Co.,
56 Kingsway, WC2,
London, England

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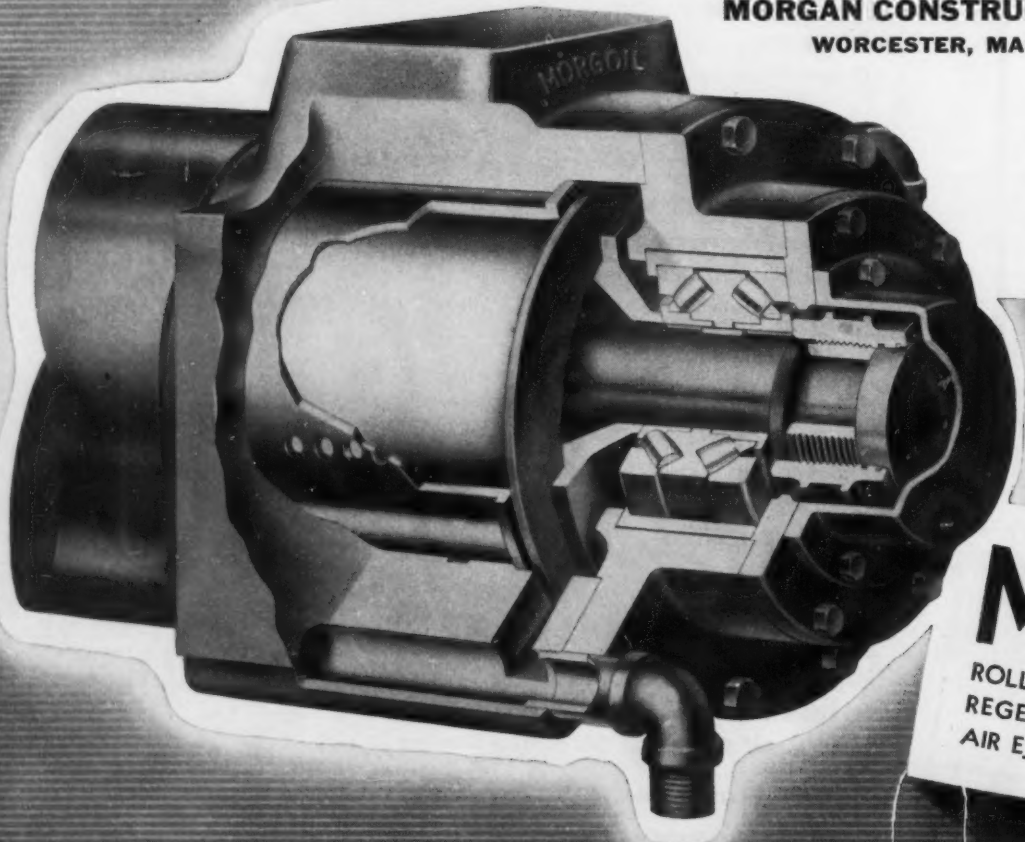
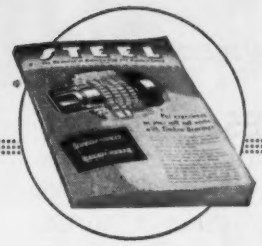


MORGAN WORCESTER
ROLLING MILLS • WIRE MILLS
REGENERATIVE FURNACE CONTROL
AIR EJECTORS • GAS PRODUCERS



November 10, 1947

Do It Without Controls

With the convening of the special session of Congress only a week away, administration advisers still are working frantically to evolve a plan for combatting inflation at home while extending large-scale aid to Europe that will win majority acceptance.

One difficulty lies in striking differences of opinion as to how the aid can be extended without acutely aggravating domestic shortages and inflationary tendencies which already are approaching the danger point. The Krug report on "National Resources and Foreign Aid" and the more recent report of the President's Council of Economic Advisers agree that any substantial aid that is extended to Europe will intensify the effect of shortages and price movements at home.

The council advises that the way to offset this further aggravation of domestic difficulties is to reimpose export controls, allocate specific products for domestic use, discourage misuse or excessive use of critical items, increase the efficiency of transportation and distribution and curb speculation and hoarding. Apparently the administration at present is favorably disposed toward following this advice to the extent of reimposing limited government controls on certain specific items, including steel.

Considering the gratifying gains in production that have occurred since government controls were abandoned, many thoughtful persons in this country feel that the nation should exhaust every other possible means of solving this problem before risking a return to government restrictions. If the war experience with rigid controls proved anything convincingly, it was that partial controls are ineffective and that one control automatically leads to others.

Also, the present administration has demonstrated on numerous occasions a willingness to impose deflationary controls on some items while stubbornly maintaining inflationary policies for wages, food products and some other political pet projects. It is unlikely that the administration will retreat from its inflationary position regarding these matters.

One way to approach the problem of foreign aid and inflation would be to first put down in detail the exact amounts of goods to be sent abroad. Then let government and industry confer as to how best to do the job. If they can find a way to do it without controls—and we think they can—we'll be far ahead a year from now.

* * *

NORMAL SCRAP SOURCES: Quotas on ferrous scrap that were adopted at a White House conference on Sept. 24 probably will be exceeded. On that date four government agencies undertook to make available 850,000 tons of scrap by Dec. 31. The Army promised 150,000 tons, the Navy 200,000, the Maritime Commission 400,000 and the War Assets Administration 100,000 tons.

At present there are indications that 967,000 tons of scrap may be forthcoming from these agencies by the year-end. Possibly the total may reach 1,300,000 tons. The uncertain factor is whether or not the Maritime Commission can come through with its projected program of scrapping ships.

Quotas for the first half of 1948 total 1,230,000 tons—300,000 from Army, 130,000 from Navy, 200,000 from Maritime Commission, 75,000 from WAA, and 525,000 from overseas sources. Informed industrialists feel that Army, Navy and Maritime Commission quotas and performance are praiseworthy but that WAA is shirking. They estimate WAA could produce

(OVER)

4,000,000 tons of scrap in a few months.

It is important, of course, to gather as much of this wartime scrap as possible for the present emergency. However, this is a non-recurring source of scrap. Even more important in the long run is to restore the normal flow of recurring scrap, which has been a major contributing factor to America's strength industrially.—p. 82

* * *

POTENTIAL BIG BUYER: Figures from the Civil Aeronautics Administration show that the number of registered airplanes in the United States increased from 13,772 in 1939 to 93,920 as of July 1, 1947, and that during the same period the number of airports increased from 2228 to 5418.

A federal aid program provides $140.9 million in 1947 and 1948 for constructing and improving 908 airports. Half of this amount will be furnished by the federal government and half by local sponsors. The program will involve runways, lights and beacons, hangars, shops, offices and fencing.

Currently these requirements may seem modest in comparison with the tonnages of materials and equipment demanded by rail, highway and water transportation. However, if transport by air grows in the next quarter-century at the rate it has grown in the past decade, the aviation industry will become an important consumer of industry's products. —p. 86

* * *

CHARGING BOX PASSE? Discussions on the use of oxygen in open-hearth furnaces sooner or later encounter the problem of charging materials. Charging time once was one-sixth of heating time. With oxygen enrichment, it is about one-third of heating time.

To meet this condition, it has been suggested that a one-time charge be substituted for piecemeal charging box procedure. For example, instead of charging a furnace with 90 tons of cold metal in ninety 2000-lb charging boxes in 50 minutes, the 90 tons would be charged in a single operation in 6 minutes.

This proposal could not be applied to existing open-hearths economically, but it could be adopted in the construction of new steelworks. There is no reason on earth why improvements in material handling that are so marked in many branches of the metalworking industries cannot be adopted advantageously in primary steel production. —p. 126

SIGNS OF THE TIMES: General Motors President C. E. Wilson's forecast of a 10 per cent increase in motor car production in 1948—meaning an output of about 5,500,000 cars and trucks (p. 89)—is predicated on the assumption that there will be no work stoppages in the coal or steel industries and no excessive allocations of steel for Europe. The increase, he believes, will be in passenger car output. Thus, production of trucks would hold at about 1,400,000, which is the 1947 output, and production of passenger cars would increase from 3,600,000 in 1947 to 4,100,000 in 1948. . . . According to a survey conducted by the National Association of Purchasing Agents, sales, production and shipments continued their strong upward trend in October and no signs of letdown in the immediate future are visible. Only 3 per cent of reporting companies indicated lower business volume than in the previous month (p. 94), this being the smallest number so reporting in any month this year. . . . H. H. Fuller, president of Bethlehem Pacific Coast Steel Corp., declares that nearly four-fifths of West Coast steel consumption can be satisfied by western mills. He figures finished steel requirements of the area at 3.5 million tons annually (p. 85), 2,750,000 tons of which can be supplied by local facilities. . . . Until Hitler's defeat, Germany purchased about half of Sweden's annual production of 15,000,000 tons of iron ore. With Germany's steel industry languishing and American steelmakers seeking new sources for high grade ore (p. 114), the United States suddenly has become Sweden's No. 1 iron ore customer. . . . When Electro-Motive Division of General Motors celebrated its 25th anniversary (p. 87), it also dedicated a new Locomotive Development Center to conduct research for the service of American railroads. . . . Now that carbide is replacing high speed steel in cutting tools, the problem of reconditioning and handling cutters has been intensified. It pays to be systematic about the care given carbide cutters (p. 102) between the time they leave the tool room or grinding crib and the moment they are placed on the spindle of the machine. . . . Exports from the United States declined in September for the fourth consecutive month and imports rose (p. 85), narrowing the excess of exports over imports to the smallest margin reported since last January.

E. L. Shaner

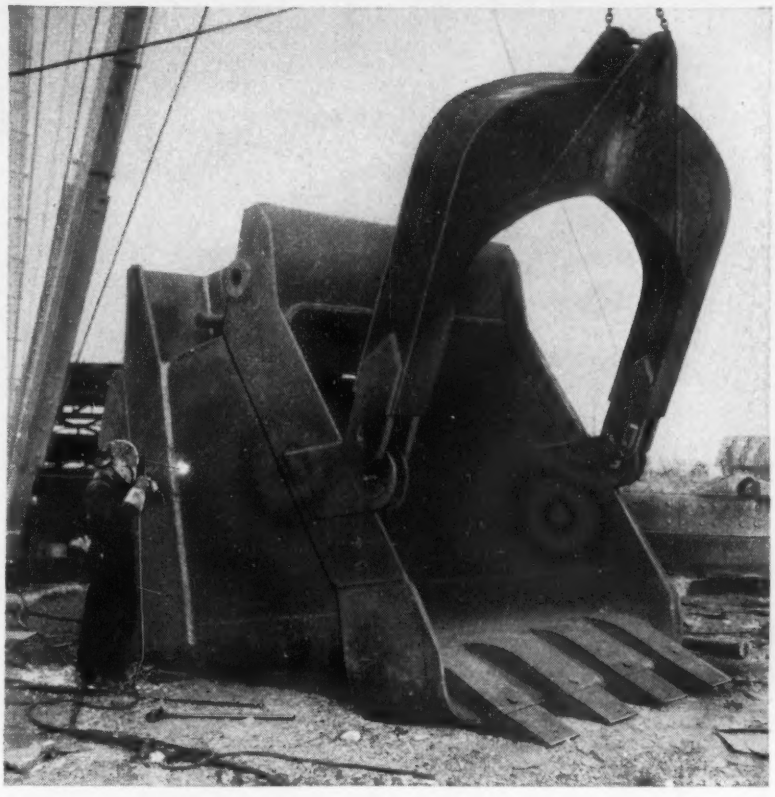
EDITOR-IN-CHIEF

This Bucket holds 77% MORE

. . yet WEIGHS 23% LESS

when made of

INLAND HI-STEEL



This stripper bucket is another example of how large weight reductions can be made with Hi-Steel. Yet it welds as well or better than ordinary structural steel, and it can be cold formed, hot worked, and machined just as easily, so that the most economical fabrication processes can be used.

AVERAGE PROPERTIES OF INLAND HI-STEEL compared with those of ordinary structural steel

	INLAND HI-STEEL	ORDINARY STRUCTURAL STEEL
TENSILE PROPERTIES (¼" Plate)		
Yield Point	62,000 lb per sq in.	33,000 lb per sq in.
Ultimate Strength	74,000 lb per sq in.	66,000 lb per sq in.
% Elongation in 8 in.	24%	25%
ENDURANCE LIMIT		
Fatigue Strength	49,000 lb per sq in.	33,000 lb per sq in.
IMPACT RESISTANCE (Charpy Impact in Ft Lb)		
Temperature		
80 degrees F	55.3 ft lb	36 ft lb
32 degrees F	43.1 ft lb	33 ft lb
15 degrees F	39.5 ft lb	29 ft lb
0 degrees F	36.3 ft lb	26 ft lb
—10 degrees F	36.8 ft lb	16 ft lb
—25 degrees F	33.7 ft lb	6 ft lb
—50 degrees F	30.4 ft lb	2 ft lb
PHYSICAL PROPERTIES FOR RIVET DESIGN		
Shear Strength	66,000 lb per sq in.	44,000 lb per sq in.
Bearing Strength	115,000 lb per sq in.	95,000 lb per sq in.

The capacity of this stripper bucket was increased 77% while its weight was reduced 23% by the use of low-alloy, high-strength, Inland Hi-Steel. The bucket was originally made of cast metal and weighed 47,000 lb. Its capacity was 13 cubic yards. By designing to take advantage of the great strength of Hi-Steel, the weight of the bucket was reduced 11,000 lb and its capacity increased to 23 cubic yards.

Inland Hi-Steel has nearly twice the working strength of ordinary structural steel, 50% greater ability to stand up under impact loads, and a marked resistance to vibration. In addition, it has about five times the atmospheric corrosion resistance and is far more resistant to abrasion.

Unfortunately, the present demand for Hi-Steel continues to exceed the supply. To make larger tonnages available to you, other steel companies have been licensed to make this superior product. Write for Engineering Bulletin No. 11, INLAND STEEL CO., 38 S. Dearborn St., Chicago 3, Ill. Offices in: Detroit, Indianapolis, Kansas City, Milwaukee, New York, St. Louis, St. Paul.

INLAND HI-STEEL meets the requirements of SAE Specification 950

INLAND STEEL

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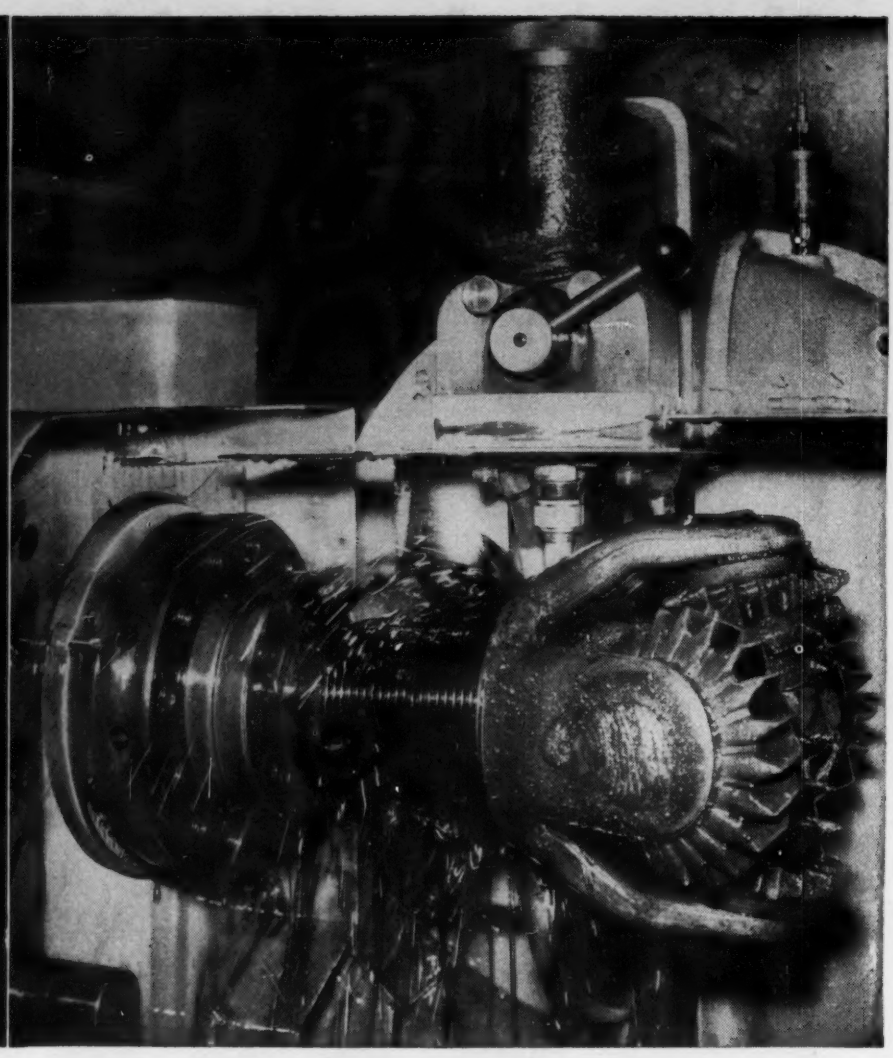
Operation Data:

Steel #4815—Electric Weld
Diameter 4", length 5½" pitch 4
—API Special Form Tapered Thread
Time cycle 4½ minutes
Rate per hour—9
Depth of cut—.165"
RPM of work—4.8
No. of dressings—one per piece
Direction of cut—regular
No. of wheel passes—1; 3-rib wheel
Metal removed per piece—1 lb. (approx.)

Wheel Data:

Norton Abrasive Wheel No. A 80 U 9 BH
Surface speed—1 per min., 10,000 to 12,000
Wheel diameter—16 to 20"
Width—¾"



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THIS thread grinding operation is a tough one, as a glance at the specifications will show you. Yet when *Texaco Grindtex Oil D* was substituted for the oil previously used, the following benefits were immediately secured –

– *Improved finish*
– *Increased wheel life*
– *Less form breakdown*
– *Decrease in oil consumption*
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Because the number of plants that are grinding rather than cutting threads is increasing daily, Texaco has developed special oils to meet the special needs of this relatively new technique. Whatever your thread grinding jobs, Texaco can help you do them faster, with greater accuracy and smoother finish.

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TUNE IN . . . TEXACO STAR THEATRE presents the TONY MARTIN SHOW every Sunday night. • METROPOLITAN OPERA broadcasts every Saturday afternoon.

Reinstitution of some wartime controls to control inflation while aiding recovery of Europe is recommended to the President by his Council of Economic Advisers. Members of the council, shown above, left to right: Leon Keyserling, Edwin G. Nourse, chairman, and John D. Clark. NEA photo

STEEL
November
10
1947

Formula for Fighting Inflationary Spiral Sought by Administration

President's Council of Economic Advisers recommends price and allocation controls to support aid to Europe. Warns serious inflation already exists in prices of steel and food. Finds help for Europe feasible

A MAGIC formula for successfully combatting inflation while extending large-scale aid to Europe is being sought by administration advisers, who are working pretty much around the clock on the problem. At week's end however, there were no indications that the plan to be presented to Congress next week by President Truman had crystallized.

Proponents of the idea of setting up limited controls on key commodities at the basic levels of distribution —on steel products at the steel mills, for example — were meeting resistance. Critics of this plan point out that during the war the first controls bred other controls, with the result that hundreds of regulations were in effect by the end of the war. They fear that limited controls now would create stresses and strains that would call for other controls progressively, with the end result beyond safe prediction.

Ask Expanded Production—One school of economists is advancing the idea that the administration should turn its efforts to increasing production rather than accepting a doctrine of unavoidable scarcity. For example, this group says, about 6 million tons of steel ingot capacity is not being used and pig iron output is about 10 per cent below rated capacity. This is due mainly to shortages of scrap and good quality coke and to fact that some of the blast furnaces are high-cost facilities. They believe that some comparatively simple moves, such as reducing exports of metallurgical coal and accelerated scrapping of war surplus materials, could increase iron and steel production substantially. They advocate a subsidy program, including accelerated depreciation and cash premiums, to put all iron and steelmaking facilities to work.

Economic Advisers Report—Washington observers who watched the wartime system of controls develop and function read the report of the President's Council of Economic Advisers skeptically. The council's report implies that reinstitution of wartime price and allocation controls is necessary.

Specifically the council advised the Chief Executive that: "The relative shortage of specific commodities requires export controls, allocations for domestic use, discouragement of misuse or excessive use, efficient transportation and distribution, and the

curbing of speculation and hoarding of goods."

In such commodities as steel and food, the council warned that "selective distribution to the most necessary domestic and foreign uses" is required to avoid serious inflationary consequences.

Such control action is needed, the council reported, regardless of whether a foreign aid program is undertaken.

Control Organization Difficult—This recommendation caused considerable head-shaking on the part of opponents of government controls in peacetime. They believe the task of setting up new controls would be extremely complicated, would require the services of many thousands of employees, and that several months would be required to create the control organization, even assuming that war-trained men from the old War Production Board and Office of Price Administration were drawn into the organization. By the time the organization was completed and the task outlined by Congress, the situation might be much changed from the present.

Aid Program Feasible—In general the President's economic advisers believe the United States can assume a foreign aid program of the size contemplated—$8 billion in the first year—without provoking runaway inflation, provided effective measures to control distribution and prices are adopted. This conclusion is based on the fact that this country during the early months of 1947 exported as much or more than will be called for under the foreign aid program.

The council stresses that problems raised by specific commodities in relatively short supply could distort or overturn the generally optimistic picture if not dealt with effectively.

These specific commodities include steel, industrial and agricultural machinery, coal, fertilizers and food.

Steel Situation Reviewed — Total production of rolled steel products during the first half of 1947, the council points out, was at an annual rate of more than 62 million tons, contrasted with less than 35 million tons in 1939. Although exports rose from about 2.5 million tons in 1939 to an annual rate of 6.5 million tons in the first half of 1947, the amount of steel available for domestic consumption is much higher than before the war. But owing to the enormous increase in domestic steel consumption, the shortage is of serious proportions and "there is not much prospect of large increase in the short run."

"The chief danger here," says the council, "is that this supply situation may be translated into further increases in the price of steel and steel products which would give additional inflationary impetus to the whole economy. High domestic and foreign demand for industrial and agricultural machinery is closely connected with the steel problem.

"The general conclusion regarding steel is this: Whether the domestic situation worsens considerably or progresses satisfactorily depends upon the use of vigorous, affirmative measures to assure distribution to the most urgent uses and to prevent a spiraling of prices."

Exports Not Responsible—Foreign demand, the council says, cannot be held responsible for recent increases in steel prices to the same extent that foreign demand has caused food prices to rise.

"This is because the price of steel is determined mainly by conscious decisions of business policy. If increases of steel prices are based upon a bigger demand in relation to supply, rather than upon the need to maintain reasonable profit margins in the face of advancing costs, advances in steel prices reflect a hurtful practice which should be corrected voluntarily or through public measures.

"There is real danger that continuing steel shortages might result in further steel price increases, further spiraling into other industrial costs and prices.

"This is particularly threatening because the steel industry can with relative ease yield to the pressure of wage demands caused by rising costs of living and pass the increased cost on to the industrial consumer in the form of higher steel prices."

What About Wages?—This portion of the council's report was confusing to some economists. While apparently recommending that steel prices be held at existing or reduced levels, the report has not a word to say about holding wages at present levels and in fact recognizes that demands for increases are likely.

Some of the questions being asked about this portion of the council's report are: Is the council inviting the steel industry to accept price control as an excuse to resist demands for higher wages next year and thus incur the likelihood of a costly strike? Does the council mean that the steel industry should grant the demanded wage increases out of profits at a time when the money represented in profits has decreased purchasing power?

The report is all the more confusing in view of the tacit understanding that President Truman, even if he does not give his blessing to another round of wage increases in 1948, will not actually oppose such demands.

CHOKEPOINT

Referring to recent reports that annual exportation of 2 million tons of scrap and 2 million tons of semifinished steel would be necessary to support the Marshall Plan, Eugene G. Grace, chairman, Bethlehem Steel Corp., Bethlehem, Pa., recently said such shipments would seriously handicap steel production in this country.

Every ton of scrap exported would mean a loss of that much finished steel here, he said. Semifinished steel sent abroad would mean still added scrap losses. He suggested it would be better to let foreign countries draw on the large tonnages of war scrap which still remain abroad and to confine our steel exports largely to finished products so as to conserve this country's currently depleted scrap supply.

Steelworkers' September Hourly Wage Sets Record

Average hourly wage paid steelworkers in September set a record at $1.571, American Iron & Steel Institute reports. The previous high of $1.556 had been paid during May and August, 1947. In September, 1946, the average wage was $1.362.

September employment at 527,000 was down about 1 per cent from the previous month's total of 532,900 workers; the average work-week in the month increased to 38.3 hours, compared with 37.1 in August and 37.5 hours in September, 1946. The industry's total employment in September including salaried workers was 618,400, compared with 625,200 in August and 595,700 in September, 1946.

Total wages for employees paid on an hourly, piecework or tonnage basis amounted to $135,532,000 for September, compared with $135,778,000 in August and $113,158,000 in September, 1946. Total wages of the industry for wage earners and salaried workers were $168,859,000 in September, $169,075,000 in the previous month and $139,625,600 in September, 1946.

The industry's payroll for the first nine months of 1947 at $1,459,742,000 exceeded the full year payrolls of the industry for any peacetime year except 1946.

Harriman Asks Export Controls Be Continued

Extension called necessary to protect domestic economy and promote foreign policy of the United States

GOVERNMENT power to control exports should be extended beyond next Feb. 29 "to protect the domestic economy and promote the foreign policy of the United States."

This recommendation is made by Secretary of Commerce W. A. Harriman in a report on export controls to the President and Congress. The power is contained in the Second Decontrol Act of 1947, which expires Feb. 29, 1948. The act includes authority to limit certain imports, allocate certain domestic supplies and, by assigning priorities, to requisition goods for export.

The act gives the government authority to control the volume and destination of exports for 352 classes of products, including steel. Actually, this power has not been fully utilized in recent months and generally has been limited to tin plate, some steel products and fertilizers. Authority to control imports has been narrowed to only a few scarce nonmetallic products.

Need Continues—Discussing export controls, Mr. Harriman says the excess of total demand over supply makes it certain that the need for such controls will continue after the present act's expiration date.

"The compelling need for insulating the domestic economy against an unwarranted drain of scarce supplies is not the only consideration requiring the continuation of export controls. Under present conditions of world-wide shortage, the international distribution of these supplies we can spare has profound implications for our foreign policy. Export control permits us to direct exports of critically needed commodities where the need is most urgent, and where they can be most effectively used to speed the economic recovery of the world. Such control of exports by destination is a key instrument in enabling us to realize our foreign policy commitments and objectives."

Mr. Harriman's report summarizes the export situation with respect to steel, coal, tin and antimony, as well as a number of scarce nonmetallic items.

Steel — The continued shortage makes it advisable to continue limiting exports and deciding where they will go. Controls have been tightened lately and it is possible controls may have to be extended to steel products not now under control.

Coal — World supplies are down about 540 million tons from prewar and supplies from the United States "have become a factor of major importance in promoting the economic recovery of Europe, a basic factor of our foreign policy."

Tin—Pig tin in sight is not enough to meet all essential requirements. Tin for the preservation of food should have first claim on available supplies. Distribution controls are necessary to channel metal to the essential end uses.

Antimony—China, the leading producer in prewar years, is out of production and little is being mined domestically. Mexico is the principal source of supply, although limited amounts are coming from Bolivia. Nevertheless, supply is in fair balance with demand and controls may be lifted by year end.

AISI Technical Meeting Held in Pittsburgh Nov. 5

Second regional technical meeting in a series of four by the American Iron & Steel Institute was held Nov. 5 at Hotel William Penn, Pittsburgh, with J. E. Lose, vice president, Carnegie-Illinois Steel Corp., and J. L. Mauthe, vice president, Youngstown Sheet & Tube Co., presiding at the morning and afternoon sessions, respectively.

Speakers at the morning session included: Walter S. Tower, president of the institute; Dr. E. C. Bain, vice president, Carnegie-Illinois; L. H. Winkler, metallurgical engineer, Bethlehem Steel Co.; and Charles M. Parker, secretary, committee on manufacturing problems.

Afternoon session speakers were: C. L. Kent, metallurgical engineer, Jones & Laughlin Steel Corp.; S. D. Gladding, superintendent, Saucon Division, Bethlehem Steel; C. R. Fondersmith, superintendent, steel production, American Rolling Mill Co.; and E. I. Burke, manager of shipping, Republic Steel Corp.

Present, Past and Pending

COLD MILL ADDS 20,000 TONS TO MONTHLY CAPACITY
GRANITE CITY, ILL.—Granite City Steel Co.'s new 56-in. cold reduction strip mill will add 20,000 tons per month, doubling the mill's former cold rolling capacity. The mill, scheduled to start late this month, will reduce 1/8-in. hot-rolled coils to 18 gage and lighter.

J & L SPENDING $100 MILLION ON EXPANSION
PITTSBURGH—Jones & Laughlin Steel Corp. is spending $100 million for expansion of facilities in a 5-year program, with $55 million yet to be expended. Program covers all departments and, with one exception, will be completed by end of 1949. Included is modernization of the hot sheet-strip mill at Otis Works, Cleveland, to cost $12.7 million and to be completed by March, 1950.

ELECTRICAL SHEETS PRODUCED ON NEW COLD MILL
VANDERGRIFT, PA.—More silicon and special alloy steel sheets for the electrical industry are in sight as result of the starting of Carnegie-Illinois new 54-in. cold reduction mill. Mill is capable of operating at a speed of 1500 ft a minute, handling coils weighing up to 7½ tons.

BETHLEHEM OPERATING AT 102 PER CENT
BETHLEHEM, PA.—Bethlehem Steel Co.'s scheduled rate of ingot operations for November is 102 per cent of capacity, unchanged from October when company established an all-time record by producing 879,285 tons of finished products.

CAR INSTALLATIONS EXCEED RETIREMENTS
WASHINGTON—September was the first month in 1947 that freight car installations exceeded retirements. Installations totaled 7182 and retirements 6514. October installations totaled 8395.

ALLEGHENY LUDLUM ORDERS MORGAN MILL
BRACKENRIDGE, PA.—Allegheny Ludlum Steel Corp. has ordered a 40-in. electrically powered slabbing, blooming mill for late 1948 delivery from Morgan Engineering Co., Alliance, O. To cost $3.5 million, it will replace the blooming mill at the company's Brackenridge plant.

Trade Pact Covers 45,000 Items

Reciprocal agreements negotiated with 22 nations at Geneva. Treaty details yet unavailable but duty concessions on some products included

TENTATIVELY Nov. 18 has been set as the date on which the Government Printing Office will begin to fill orders for the book containing the new reciprocal trade agreements negotiated by the United States at Geneva, Switzerland, with 22 other countries belonging to 16 customs areas.

The qualifying word "tentatively" is used because there still is uncertainty as to whether the printing office can complete the job by that time. The agreements will make up a "huge volume," and while there is no telling as to its size and number of pages, it can be stated that in addition to the very long overall treaty itself some 45,000 commodities on which deals were made will be listed.

Signed Oct. 30—Actual signing of the agreement took place at Geneva Oct. 30. The participating nations, says a State Department release, carried on three-quarters of the world's trade before the war and the more than 45,000 items included account for two-thirds of the trade among the countries in the group. "It thus represents the most comprehensive action ever undertaken for reduction of barriers to trade."

The countries in the agreement include Australia, the Belgium-Netherlands-Luxemburg Customs Union, Brazil, Canada, Chile, China, Cuba, Czechoslovakia, France, India and Pakistan, the Customs Union of Lebanon and Syria, New Zealand, Norway, the Union of South Africa, the United Kingdom, Burma, Ceylon, Southern Rhodesia and the United States.

Nation Benefits—The State Department points out that by the overall treaty the United States will enjoy the benefits of the concessions granted by all participating nations to each other in the separate agreements in which we had no part.

As to details, only this much information so far has been revealed:

"Action on individual products included substantial reductions in duties on some products, the binding of low rates of duty on others, and the binding of free entry on still others. Preferences affecting a large part of our trade with countries in the British Commonwealth have been substantially reduced and preferences on a long list of products which we export to the various countries of the Commonwealth have been eliminated. Under the terms of the agreement, no new preferences can be created and no existing preferences can be increased.

"The concessions on tariffs and preferences contained in the agreement are safeguarded by general provisions designed to prevent participating countries from nullifying such concessions by resorting to other forms of restriction or discrimination. These provisions cover restrictive methods of customs administration, discriminatory internal taxes and regulations, import quota systems and exchange controls, and the operations of state trading enterprises. They require the general application of the principle of most-favored nation treatment in international trade."

Concessions Within Limits — Concessions made by the United States, the State Department says, are within the limits prescribed by Congress in the Reciprocal Trade Agreements Act, and all of the concessions are subject to a provision required by American procedure under that act. If, through unforeseen developments, says the State Department memorandum, a particular tariff reduction should increase imports so sharply as to cause or threaten serious injury to domestic producers, the country granting the reduction may suspend its operation in whole or in part. Other countries then may withdraw equivalent concessions so that the balance of the agreement may be restored.

DENIES ELECTIONS

National Labor Relations Board refused last week by unanimous decision of its five-man panel to conduct collective bargaining elections for two CIO unions and one AFL group because union officers have not disavowed communist ties.

The action means the board will not hold an election for any union unless its officers comply with the Taft-Hartley law requirement for signing non-communist affadavits and supplying financial information to the government. This applies to election cases pending before the board when the act was passed.

Action was taken in cases involving United Steelworkers-CIO and Rite-Form Corset Co. Inc., Sharon, Pa.; United Furniture Workers-CIO and Unagusta Mfg. Co., Hazelwood, N. C.; and United Construction Workers, an affiliate of United Mine Workers-AFL, and Tennessee Chair Co. Inc., Elizabethton, Tenn.

Lustron To Build Steel Homes in Columbus Plant

Mass production of low-cost, porcelain enamel steel houses moved two steps nearer to reality last week when Lustron Corp. completed its financing with total capitalization of $16,230,000 and signed a lease with War Assets Administration for one million sq ft of manufacturing space in the Columbus, O., plant operated during the war by Curtiss-Wright Corp.

Lustron, which had previously been unsuccessful in its attempts to lease the former Dodge-Chicago plant in Chicago, now occupied by Tucker Corp., will pay $426,800 annual rental for the space in the surplus aircraft plant. It will also assume taxes, insurance and maintenance costs.

Initially, the company plans to build five-room ranch-type bungalows, each home to cost about $7000 and to incorporate numerous built-in features in its 1050 sq ft of space. Priority on the houses will be given veterans. Within nine months, according to Carl G. Strandlund, president, the company expects to be turning out houses at a rate of 30,000 a year. Source of steel sheets for this output has not been disclosed but the company indicates it has been assured of supply.

Mr. Strandlund, incidentally, has resigned as vice president and general manager of Chicago Vitreous Enamel Co. to devote full time to Lustron and announces that the Chicago company has withdrawn from the new enterprise, having sold all its rights.

Third Quarter Steel Income Cut Slightly

Aggregate net earnings of 22 producers down from second quarter. Higher costs, production interruptions reflected

INCREASED operating costs and production interruptions lowered slightly the aggregate net earnings of the steel producing industry in the third quarter of this year from those of the preceding quarter. This continued the trend started in the second quarter, when total net earnings dropped from those of the initial quarter of 1947.

Compilation by STEEL shows that 22 steel producers representing 86.9 per cent of the nation's ingot capacity had aggregate net earnings of $85,806,013 in the third quarter, compared with $87,765,728 in second quarter and $115,320,439 in the first quarter of this year.

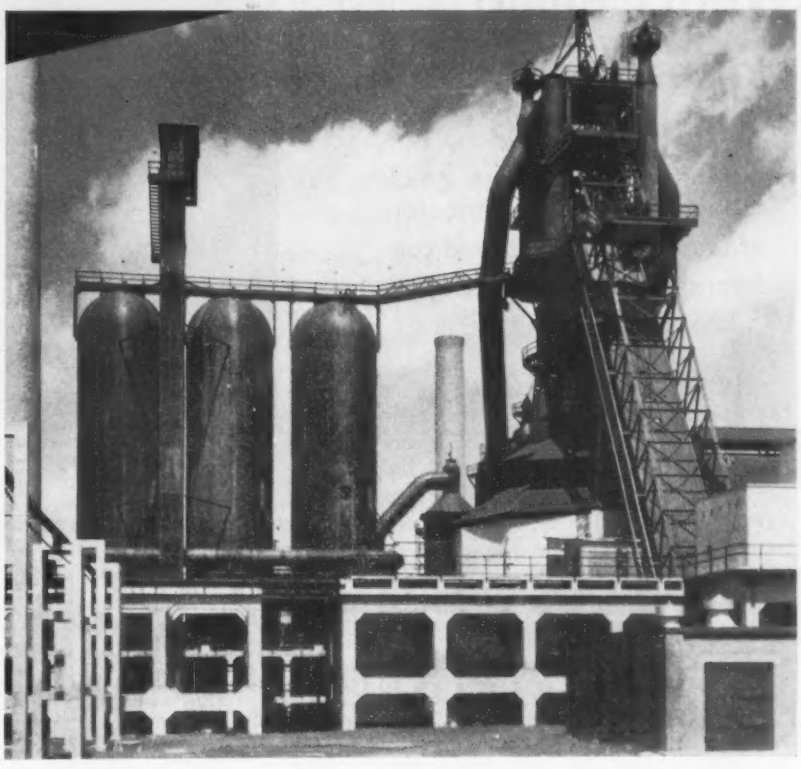
In the third quarter, 15 of the 22 companies had lower net earnings than in second quarter.

Production Rate Down—Although there was no weakening in demand for steel, the ingot production rate in the nation dropped from 93.7 per cent of capacity in the second quarter to 88.5 per cent in the third quarter, reflecting effects of vacations, holidays, hot weather, coal miners' strike, and a railroad strike.

In the third quarter of 1946 when the nation's ingot production rate was slightly less, 86.5 per cent of capacity, the 22 producers also had a correspondingly lower net income than in the third quarter of 1947. Their aggregate for the 1946 quarter was $82,536,289.

Because operating conditions in early 1947 were much more favorable than in the first part of 1946 when major strikes occurred, the 22 companies were able to show total net earnings of $288,892,180 for the first nine months of this year, compared with only $163,776,677 in the corresponding period of last year.

Production Costs Rise—Also detracting from the industry's earnings position in the third quarter of 1947 were increases in production costs, reflecting in large part the substantial wage increases for steelworkers and miners, effective Apr. 1 and July 1, respectively, and the higher prices paid for steel scrap, raw materials and supplies.



War-built blast furnace at Daingerfield, Tex., now is producing pig iron for the Lone Star Steel Co. Photo shows three stoves in background and stack at right

Texas Blast Furnace in Production

TEXAS pig iron is being shipped to both the Pacific and Atlantic seaboards today from the Lone Star Steel Co., Daingerfield, Tex., which has just blown in the 1200-ton blast furnace leased from the War Assets Administration.

Present output is being consigned to the Federal Housing Authority for use in emergency housing under the terms of the three-year lease. Housing agencies will receive all the iron until output reaches two-thirds of rated capacity. Then a portion of the iron will go to Ford Motor Co., Kaiser-Frazer Corp. and other consumers.

The Lone Star stack and other facilities were constructed early in the war by Defense Plant Corp. at a cost of about $35 million. A group of Texans, headed by John W. Carpenter, president of the Texas Power & Light Co., subscribed sufficient funds to lease the plant for three years and start its operation under private management. Company is planning to exercise a lease option to buy the plant outright.

The Daingerfield stack is equipped with three hot blast stoves 25 ft in diameter and 115 ft high, capable of heating 100,000 cu ft of blast a minute on a straight line temperature of 1600 degrees F.

The furnace is 3½ miles from the $4.5 million ore beneficiation plant located on East Texas ore deposits. The beneficiation plant uses some processes said to be innovations in the industry. It utilizes a carbonate ore, which is calcined before charging. The ore deposits are mined by stripping an average of 4 ft of overlaying earth.

The Lone Star plant also includes two coke oven batteries of 39 ovens each, with a rated capacity of 1200 tons of blast furnace coke or 900 tons of foundry coke daily.

Company operates three coal mines in southern Oklahoma, with aggregate capacity of 20,000 tons weekly. Company has no steelmaking facilities.

E. B. Germany is president of the Lone Star and Mr. Carpenter is chairman of the board.

What's Being Done About Distribution?

Manufacturers and distributors of industrial supplies hold conferences aimed at developing new sales policies

GREAT deal has been said since the end of the war about the need for more production in achieving economic stability, lower prices and improved living standards. Everyone agrees, industrialist and laborer, and much effort has been expended in overcoming obstacles to greatest possible output.

Relatively little, however, has been heard about the need for improved and enlarged distribution systems so necessary if the goods and products of industry are to be kept moving into consumption at the accelerated pace which production demands.

Something Being Done—Something is being done about distribution, nevertheless. Manufacturers and distributors of industrial supplies and equipment many months ago recognized problems confronting them and undertook to develop a program aimed at keeping their activities in step with the expanding economy. Currently they are holding a series of conferences to develop policies leading to easier flow of goods into use, lower distribution costs and larger volume sales.

Last week the American Supply & Machinery Manufacturers Association Inc. and the National Supply & Machinery Distributors' Association inaugurated a series of joint regional conferences at the Netherland Plaza Hotel, Cincinnati, under the chairmanship of W. W. Kemphert, Worthington Pump & Machinery Corp., Harrison, N. J.

Pointing out that the world is beset with shortages following the war, Joseph E. Waltz, Waltz-Dettmer Supply Co., Cincinnati, said this country must produce more than its share or the world economy will collapse; that in our country unless we can produce at lower cost, the rising cost of labor, resulting from rising living costs, will continue to mean rising prices. And continuing rising prices will mean an eventual depression.

Starting in the defense period and continuing through the war, the sales resistance encountered in sales work in this industry hit an all-time low, he said, but the nation is now definitely in a period where sales effort is required to make sales.

W. W. KEMPHERT

Salesmen Training — Mr. Waltz and Robert Wier Jr., sales manager, Brush Division, Osborn Mfg. Co., Cleveland, maintained that training of salesmen should be a continuous process.

A necessary antecedent to the subject of training salesmen is that of selection of salesmen, stated E. J. Tone Jr., vice president and general sales manager, Carborundum Co., Niagara Falls, N. Y.

Sales Effectiveness—The Carborundum Co. has increased the effectiveness of its sales force, reduced the cost of training, and improved overall distribution by use of aptitude analysis, coupled with comprehensive interviewing procedure.

W. E. Price, president, Knapp Supply Co., Muncie, Ind., outlined the limitations of aptitude tests, especially as they apply to smaller concerns, but urged adoption of a definite plan of salesmen-selection by each company.

J. A. Proven, vice president, Sterling Tool Products Co., Chicago, and W. H. Clark, president, Samuel Harris & Co., outlined plans under which markets can be evaluated.

Papers prepared by Everett Addoms, Charles H. Besly & Co., Chicago, and W. W. French, director of sales promotion, Dodge Mfg. Corp., Mishawaka, Ind., on "Packaging and Labeling" outlined recent developments in this field which are leading to increased sales and efficiency in distribution.

Among interesting points brought out in an open forum discussion were that distributors' inventories are relatively high in comparison with current business; that large reserves must be set up to cover possible losses when readjustments are made from present high price levels; and that distributors' operating costs are seriously reducing margin of profit.

Contract Tool, Die Shops Find Horizons Wider

Mass production industries depend increasingly on outside suppliers. NTDMA draws 300 to Philadelphia convention

ATTENDANCE of 200 members and nearly 100 guests marked the second annual meeting of the National Tool & Die Manufacturers' Association in Philadelphia Nov. 2-5. This relatively new member of the family of trade associations includes in its membership most of the leading contract tool and die shops upon which metal product manufacturers in the mass production categories are placing increasing dependence either to augment their own tool rooms or to supersede them entirely.

This meeting, held at the Benjamin Franklin Hotel, was concerned with many phases of the business which were not given adequate attention in days when contract shops operated as entities almost entirely out of touch with what other people in the industry were thinking and doing. Among those things are—apprenticeship, business management, government relations, estimating work, accounting methods, etc.

World Outlook — Men of high caliber appeared as guest speakers at this meeting. On Monday, Ray Sullivan, vice president in charge of production, E. W. Bliss Co., Detroit, representing Marshall M. Smith, president of the company, delivered Mr. Smith's address on "Industry's Future in an Explosive World." Mr. Smith, who has just returned from an extensive trip through European countries, has been forced to take a rest to recover from dietary deficiencies resulting from that journey.

According to Mr. Smith, "Any continuation of the lending policies we have followed to date can only serve to bolster the present socialistic regimes and prolong their tenure of office—and at the same time postpone sound reconstruction. In this international political game today, dollars are like dynamite. We have to be realistic. We must stop one-sided deals. We must stop exchanging dollars for good will."

On Tuesday, Richard F. Moore, president, Moore Special Tool Co. Inc., Bridgeport, Conn., dealt with "Realistic Methods of Estimating." Taking a blueprint of a typical mul-

tiple die set of piercing and shallow forming, he demonstrated the use of an estimating sheet on which labor and materials involved are analyzed item-by-item by an experienced estimator so that nothing is overlooked in summing up the final estimate. This takes the place of the "guesstimating" which too frequently is indulged in on competitive bids in the industry.

Labor Legislation — At this same session, Eugene B. Schwartz, attorney, Cleveland, recited some of his experiences as a consultant on labor legislation. He analyzed the Taft-Hartley Act as something which put capital and labor more nearly on an equal basis in dealing with each other, but which by no means is the "slave labor" act which unions claim it to be. No employer should expect that he can sue a union when two pickets appear in front of his plant, if those two pickets do not physically keep several hundred workers from entering the plant. It will, however, help in preventing picketing of workers' homes if the workers do choose to go to work.

At the luncheon on Tuesday, Dr. Donald A. Laird, well-known psychologist and author, gave some common sense suggestions on how to keep on good terms with workers. According to him, tactful foremen are vitally necessary—a word of commendation being of far reaching importance to the beginner who is really trying. If criticism is necessary, it should not be expressed in front of fellow workers, he added.

The highlight of the Tuesday afternoon session was a panel discussion on "Getting Best Results in Tooling." Representing tool users were Samuel H. Paul, supervisor of tool purchases, Heintz Mfg. Co., Philadelphia, and Ralph Allen, assistant superintend-

(*Please turn to Page* 186)

Tool Engineers Crowd Technical Sessions at Semiannual Meeting

Six hundred attend ASTE's Boston convention. Discuss varied subjects including abrasives, welding, materials handling, bearing applications, clock manufacturing and educational problems. Large plants visited. C. R. Burt honored

BOSTON

THIS GREAT New England center was a beehive of industrial and engineering activity for three days, Oct. 30 through Nov. 1, when approximately 600 delegates, members and guests of the American Society of Tool Engineers held sessions at Hotel Statler marking the 15th national semiannual meeting of the society.

Attendance, filling the corridors and meeting rooms of the large hotel, covered a broad cross-section of the organization's membership of about 20,000, representatives being on hand from Canada and as far away as Texas and the West Coast.

Influence Demonstrated—Growing influence of this engineering organization of men who design the tools, jigs, fixtures, attachments and special machinery used in our mass production industries—and the gages and other inspection apparatus which control quality of metal products—was demonstrated by the high caliber of those who attended.

Also, it was attested by the nature of the institutions whose doors were thrown open to the visiting engineers. Among them were: Massachusetts Institute of Technology; the Boston Navy Yard; General Electric Co.; Boston Gear Works Inc.; Simonds Saw & Steel Co.; Pneumatic Scale Co.; and W. H. Nichols Co.

Under the leadership of W. B.

CLAYTON R. BURT

Peirce of Pittsburgh, national president of ASTE, an interesting technical program was offered which featured subjects closely related to industries in the New England area, but at the same time of national significance. For example, there was the symposium on the manufacture and use of a new kind of alundum abrasive, participated in by W. T. Montague, vice president and manager, business planning and development, A. A. Klein, assistant director of research, and G. T. Rideout, chief field engineer, all of the Norton Co., Worcester, Mass. During this symposium it was brought out that while the natural aluminous abrasive (emery) often contains less than 35 per cent of the active cutting substance, the man-made product has up to 80 per cent of alpha alumina, which is the vital ingredient.

Typical Example—This is a typical example of how modern "synthetic" products excel over those produced by nature. The value of this presentation was enhanced by pictures and movies in natural colors showing the effect of wheels on work, color of sparks, etc.

Welding was dealt with in a similar symposium featuring J. E. Anderson, assistant to works manager, and D. W. Puffer, welding section, General Electric Co., Lynn, Mass.; and E. H. Girardot, foreman, tool design section, General Electric Co., Schenectady, N. Y. One of the points

C-

tors							
Construction, Maintenance..	154,544	131,002	34,208	464	23,346	2,541	26,4
Contractors' Products	996	13,612	13,095	785	1,265	2,761	47,4
Automotive, excl. Tractors..	3,788	30,608	138,183	21,184	962	19,967	178,9
Rail Transportation	52,448	77,474	35,960	597	52	205	25,(
Shipbuilding	4,177	17,468	2,289	182	126	22	6
Aircraft	.....	318	44	402	37	244	1
Oil, Gas Drilling	3,086	8,805	5,815	507	30,325	30	1,4
Mining, Quarrying, Lumbering	1,655	4,165	4,904	216	605	215	1,6
Agricultural	3,199	9,236	41,604	4,880	89	3,112	13,2
Machinery, Industrial Equip., Tools	16,994	61,272	58,833	22,319	7,796	7,215	23,9
Elect. Mach., Equipment	4,280	11,894	8,063	3,292	121	4,823	18,5
Appliances, Utensils, Cutlery	74	1,674	877	3,138	107	2,043	30,3
Other Domestic, Commercial Equipment	1,237	11,134	7,495	3,315	263	19,807	19,8
Containers	49	7,885	2,313	48	184	8,832	57,9
Ordnance, Other Military	53	569	1,383	168	.....	31	
Unclassified	28,096	28,149	53,155	10,032	11,726	37,816	30,1
Export	22,434	30,472	37,444	5,369	18,190	13,461	15,
Total	371,265	562,040	732,315	122,550	172,966	224,274	621,8
*Less shipment to members of industry for conversion	26	22,223	64,615	1,082	10,460	15,308	43,4
Net Total	371,239	539,817	667,700	121,468	162,506	208,966	578,3

* All of these shipments were made to the group classified as "Converting and Processing."

brought out was the tremendous savings in fabrication and machining of jigs, fixtures and special tools through welding techniques. This enables jigs and fixtures to be applied on comparatively short run jobs, and also cuts the overhead on long run work.

Other Symposiums—Other similar symposiums were set up on Materials Handling (with Edward J. Burnell, vice president, Link-Belt Co., Chicago; C. A. Litzler, president, Industrial Oven Co., Cleveland; P. R. Minich, district manager, Rack Engineering Co., Philadelphia; and Homer H. Dasey, president, Visual Production Planning Inc., Pittsburgh); Bearing Applications (with E. W. Miller, vice president, Fellows Gear Shaper Co., Springfield, Vt.; Lewis Sandler, executive vice president, Johnson Bronze Co., Newcastle, Pa.; and F. E. Ericson, executive vice president, Barden Corp., Danbury, Conn.); Education of Tool Engineers (with William T. Alexander, Dean of Engineering, Northeastern University, Boston; William D. Merrifield, assistant director in charge of technical training, Chrysler Corp., Detroit; and Dr. Mark Ellingson, president, Rochester Institute of Technology, Rochester, N. Y.); and Tooling for Watches and Clocks (with Walter E. Mutz, treasurer, Chelsea Clock Co., Chelsea, Mass.; Harry B. Whitehead, general superintendent, Telechron Inc., Ashland, Mass.; E. W. Drescher, superintendent of production, Hamilton Watch Co., Lancaster, Pa.; and Roger Tarpy, managing director, Vulcan New England Industrial Consultants, West Hartford, Conn.).

High point of this meeting of ASTE came with the banquet on Saturday evening, at which Clayton R. Burt, chairman of the board, Pratt & Whitney Division, Niles-Bement-Pond Co., West Hartford, Conn., was guest of honor and main speaker. As a tribute to Mr. Burt's outstanding achievements over a period of more than 50 years in the tool engineering and machine tool building industry, a notable group of engineers and industrialists were present at the head table with Mr. Burt—among them being Herbert H. Pease, president of the National Machine Tool Builders' Association.

Reviews Experiences — Speaking without notes, Mr. Burt gave a highly interesting review of his experiences—including participation in the famous Paris Exhibition in Paris in 1900. He cited the fact that at that time a good milling machine sold for about $800, whereas a comparable machine today costs around $4000. In the meantime there have been great increases in weight and in power, which give greater productivity to justify the increased price.

Mr. Burt is convinced that in the past decade there was as much machine tool progress as in the 40 years prior to that time. This recent progress was exemplified in the recent Chicago Machine Tool Show, the lessons of which must be heeded by industrialists lest they fall behind in the competitive race. He expressed conviction that America's salvation in a troubled world depends on hard work, continued engineering progress and continued preparedness.

NEW STEEL STUDY

Study of long-term steel demand will be undertaken by the Department of Commerce, probably for the period through 1955. This decision is in response to insistent demands from a number of sources, including congressional committees and administration agencies, that such a study be made.

Commerce Secretary Harriman is expected to announce shortly a program of procedure to be followed in making the study. Because of the many factors that will have to be considered, it is expected the study will require six months or more to complete.

To Discuss Navy Needs at Washington Conference

A precedent in off-the-record discussion of military needs will be set when the Navy and the Navy Industrial Association collaborate in a 2-day conference Nov. 18-19. Heads of various Navy bureaus will state their problems, and their approaches to them, to the representatives of some 500 corporations and of a large number of research institutions and colleges. Theme of the conference will be "Teamwork in research and development work between Navy Department and industry and the colleges."

Navy bureau heads, including officers in charge of the Navy's Office of Naval Research, have arranged the program in close contact with Dr. M. J. Kelly, executive vice president, Bell Laboratories Inc., and chairman of the Navy Industrial Association's Research & Development Committee.

The conference will be held in the Interior Department Auditorium, Washington.

Trade Problems Discussed by Drop Forgers

Topics at fall meeting in Detroit include labor situation, steel supply, markets and technological developments

CURRENT labor situation, outlook for steel supply, expanding markets, industry statistics and recent technological developments in the industry were among subjects discussed at the fall meeting of the Drop Forging Association at Hotel Statler, Detroit, Oct. 31-Nov. 1.

Raymond B. Tripp, president of the association and executive vice president, Ohio Forge & Machine Corp., Cleveland, opened the 2-day meeting.

Reports Submitted—Other speakers at the opening session were Ralph A. Mitchell, vice president, Pittsburgh Forgings Co., Coraopolis, Pa., who submitted the report of the association's board of directors, and Raymond M. Seabury, secretary-treasurer of the association, who presented his report as treasurer.

In addition, the following committee reports were submitted: Safety, by Holloway Kilborn of the association staff; Estimating, by Lawrence C. Ingold, chief engineer, Pittsburgh Forgings Co.; Forging Industry Handbook, by George W. Motherwell, works manager, Wyman-Gordon Co., Worcester, Mass.; Heavy Hammer Maintenance, by Roy E. Hess, factory manager, Transue & Williams Steel Forging Corp., Alliance, O.; Technical & Research, by Charles E. Stone, president, Interstate Drop Forge Co., Milwaukee; Advertising, by James E. Sweeney, vice president, Kropp Forge Co., Chicago.

Another speaker at the Friday sessions was James E. Gaspardo, treasurer, Ladish Co., Cudahy, Wis., who spoke on "Cost Unconsciousness."

On Saturday, Nov. 1, a round-table panel discussion titled "What's Wrong, and What Can We Do About It," commanded the attention of the convention. Serving as discussion leaders were: Harold E. Brey, vice president and general manager, Unit Drop Forge Co., West Allis, Wis.; Edwin J. Carlson, president, Indiana Forge & Machine Co., East Chicago, Ind.; Arthur M. Cornell, president, Cornell Forge Co., Chicago; Harmon Wilkes, general manager, Modern Drop Forge Co., Blue Island, Ill.

Steel Distribution Pattern Holds Steady; Exports Rise Slightly

FINISHED steel distribution to metalworking industries in August followed closely the pattern of earlier months. Automotive industry continued the leading consumer, with construction, rail transportation and containers following in the order named.

Warehouses and other distributors continued to receive more than any single consuming industry and in August took 858,314 tons, 16.2 per cent of the month's total of 5,278,223 net tons of finished steel. In the first 8 months of this year, warehouses received 16.6 per cent of total finished steel shipments.

Automotive manufacturers, excluding tractors, received 723,576 tons of steel in August, 13.7 per cent of the total. For the 8 months, they received 5,785,836 tons, 13.9 per cent of the total of 41,401,385 tons.

Construction and maintenance held second position among consumers for August, with receipts of 531,790 tons, slightly more than 10 per cent of the total. For the first 8 months, building has taken 4,080,575 tons, 9.8 per cent of the total.

Containers in third place are running ahead of rail transportation. Container manufacturers received 449,553 tons in August and for the first 8 months 3,339,469 tons, or 8 per cent of the total. Rail transportation received 393,201 tons in August and 3,249,993 tons for the year to August, 7.8 per cent of the total.

Export shipments rose above the year's average in August when 6.8 per cent of output, 358,785 tons, were shipped abroad. In July, exports totaled 306,378 tons, 6.1 per cent of the month's output. For the first 8 months, 6.6 per cent, or 2,751,423 tons, have been exported.

September Steel Shipments Hold Record-Breaking Pace

Shipments of steel products to consumers maintained a recordbreaking peacetime rate in September, amounting to 5,118,839 tons compared with 5,278,223 tons in August, according to the American Iron & Steel Institute. This brought the total for the first nine months to 46,620,218 tons, or only 2,155,314 tons under the total for all of 1946.

September shipments of sheet and strip amounted to 1,501,024 tons compared with 1,469,847 tons in August. This brought total shipments for the first nine months to 13,480,823 tons, or about 29 per cent of the total.

Shipments of all types of pipe and tubing totaled 497,429 tons in September compared with 516,541 tons in August. Shipments for the first nine months of 1947 totaled 4,474,910 tons, or about 9.5 per cent of the total.

Hot-rolled carbon bar shipments amounted to 744,499 tons in September, compared with 799,223 tons in August. Total for the first nine months was 7,057,309 tons, accounting for 15.1 per cent. Shipments of cold-finished bars aggregated 122,372 tons in September compared with 121,468 in August, making the total for the first nine months 1,283,152.

Plate shipments came to 494,701 tons in September compared with 539,817 tons in August, making the nine-month total 4,652,331 tons.

Steel Distribution, 8 Months, 1947

(Leading products, of all grades, including alloy and stainless)

Market Classification	Net Total (All Products) in Net Tons
Converting and Processing	3,701,955
Jobbers, Dealers, Distributors	6,891,187
Construction, Maintenance	4,080,575
Contractors' Products	1,480,581
Automotive, excl. Tractors	5,785,836
Rail Transportation	3,249,993
Shipbuilding	211,890
Aircraft	28,081
Oil, Gas Drilling	595,434
Mining, Quarrying, Lumbering	185,337
Agricultural	799,139
Machinery, Industrial Equip., Tools	2,108,425
Elect. Mach., Equipment	1,048,290
Appliances, Utensils, Cutlery	1,032,011
Other Domestic, Commercial Equip.	1,102,144
Containers	3,339,469
Ordnance, Other Military	24,539
Unclassified	2,985,076
Export	2,751,423
Total	41,401,385

Distribution of Steel Products–August, 1947

(In net tons of leading products of all grades, including alloy and stainless)

Market Classification	Shapes	Plates	Hot-Rolled Bars	Cold-Finished Bars	Seamless Tubing	Drawn Wire	Hot-Rolled Sheets	Cold-Rolled Sheets	Coated Sheets	Hot-Rolled Strip	Cold-Rolled Strip	Total (All Products)
Converting and Processing	3,973	44,038	184,654	13,405	11,601	86,220	62,965	4,018	1,989	36,379	6,870	931,826
Jobbers, Dealers, Distributors	70,182	72,265	101,996	32,247	66,171	14,929	66,352	35,955	37,556	10,032	3,144	858,314
Construction, Maintenance	154,544	131,002	34,208	464	23,346	2,541	26,490	2,417	6,419	4,734	1,401	531,790
Contractors' Products	996	13,612	13,095	785	1,265	2,761	47,487	31,084	39,576	7,527	5,977	181,393
Automotive, excl. Tractors	3,788	30,608	138,183	21,184	962	19,967	178,931	219,254	7,265	37,141	27,100	723,576
Rail Transportation	52,448	77,474	35,960	597	52	205	25,035	3,192	5,168	1,714	361	393,201
Shipbuilding	4,177	17,468	2,289	182	126	22	630	215	298	49	49	25,817
Aircraft	.....	318	44	402	37	244	112	144	22	13	19	5,391
Oil, Gas Drilling	3,086	8,805	5,815	507	30,325	30	1,455	98	117	99	98	77,038
Mining, Quarrying, Lumbering	1,655	4,165	4,904	216	605	215	1,633	224	358	370	5	21,241
Agricultural	3,199	9,236	41,604	4,880	89	3,112	13,280	2,528	4,865	7,550	232	97,969
Machinery, Industrial Equip., Tools*	16,994	61,272	58,833	22,319	7,796	7,215	23,915	8,002	1,234	11,092	5,890	247,611
Elect. Mach., Equipment	4,280	11,894	8,063	3,292	121	4,823	18,555	10,339	2,828	4,932	3,964	127,928
Appliances, Utensils, Cutlery	74	1,674	877	3,138	107	2,043	30,372	46,190	8,394	3,267	6,600	127,382
Other Domestic, Commercial Equipment	1,237	11,134	7,495	3,315	263	19,807	19,867	33,760	5,048	6,028	14,208	134,126
Containers	49	7,885	2,313	48	184	8,832	57,951	25,798	4,145	18,308	8,369	449,553
Ordnance, Other Military	53	569	1,383	168	.....	31	41	61	.....	.....	5	5,703
Unclassified	28,096	28,149	53,155	10,032	11,726	37,816	30,791	6,021	2,713	9,590	40,099	395,595
Export	22,434	30,472	37,444	5,369	18,190	13,461	15,963	11,185	5,828	5,034	1,662	358,785
Total	371,265	562,040	732,315	122,550	172,966	224,274	621,825	440,485	133,823	163,859	126,053	5,694,239
*Less shipment to members of industry for conversion	26	22,223	64,615	1,082	10,460	15,308	43,435	2,991	112	28,565	2,240	416,016
Net Total	371,239	539,817	667,700	121,468	162,506	208,966	578,390	437,494	133,711	135,294	123,813	5,278,223

* All of these shipments were made to the group classified as "Converting and Processing."

Windows of Washington

By E. C. KREUTZBERG — Washington Editor, STEEL

Tax reform study by Treasury's Tax Research Division weighs various proposals, particularly one permitting writing off of machine tools and equipment within two or three years. Report should be available in December

WIDESPREAD demand from manufacturers for tax reform that would permit faster writing off of capital assets is responsible for a study which not only will merit careful attention from industry in general but which doubtless will play a part in the shaping of the next internal revenue act.

This is a study of depreciation allowances. It will weigh the economic effect of the various proposals that have been offered—particularly the one that the law permit complete writing off of machine tools and similar equipment within two to three years. It will be much more than an analysis to show the effects of the alternate proposals upon the Treasury's income.

Available in December — The report setting forth conclusions from this study should become generally available late in December. Like all these studies it is being conducted by the Treasury's Division of Tax Research.

In the meantime, Treasury's only answer to those manufacturers who come to Washington to sound out the prospect for faster amortization is to refer them to Bulletin F of the Bureau of Internal Revenue. This is the book which sets 25 years as the depreciation period for most machine tools and various periods for steel mill items—as four years for furnace linings, 25 years for a tunnel-type annealing furnace, 20 years for an ingot-mold car, 15 years for oxyacetylene cutting equipment, 33 years for concrete bins and hoppers, 10 years for cypress pickling tanks, 13 years for charging hole covers, 5 years for cupola charging barrows, and 25 to 30 years for the various types of rolling mills.

Define Depreciation — The industry men are told that the definition for the term "depreciation" is "A reasonable allowance for the exhaustion, wear and tear of property used in the trade or business, including a reasonable allowance for obsolescence." They are told that under this definition they have considerable latitude. But until Congress specifically authorizes "fast depreciation," there is no chance for Treasury adoption of a policy such as prevailed during the war and such as would have prevailed had Congress granted the request of James F. Byrnes for a 5-year period when the latter served as director of reconversion.

Government Scrap Comes Out

Offerings of ferrous scrap by the government over the remainder of this year will be well over the quotas fixed at the White House conference on Sept. 24. At that time four government agencies undertook to make 850,000 tons of scrap available by Dec. 31—150,000 from the Army, 200,000 from the Navy, 400,000 from the Maritime Commission and 100,000 from the War Assets Administration.

The total is expected to be increased to 967,000 tons, and it may be increased to 1,300,000 tons. Final results depend on how effectively the Maritime Commission can carry out its plans.

Offers Large Tonnage — Maritime Commission already has offered or scheduled to be offered prior to Dec. 31 ships containing 355,925 lightweight tons of ferrous scrap. It expects to offer prior to that date for scrapping ships that contain an additional 161,745 tons. Maritime Commission also will offer for scrapping such ships as it places on sale for further operation but which will find no buyers willing to operate them. Ships involved in this category have a scrap potential of 336,625 tons.

White House spokesmen interested in the program say they have no information as yet as to how well the objectives for first half of 1948 will be attained. First half quotas come to a total of 1,230,000 tons. This includes 300,000 tons from the Army, 130,000 tons from the Navy, 200,000 tons from the Maritime Commission and 75,000 tons from the War Assets Administration, also overseas scrap of 500,000 tons from the Army and 25,000 tons from the Navy.

Industry comments are that the showing is good all the way through excepting for the War Assets Administration. They estimate that WAA could put 4,000,000 tons of scrap on the market in the next few months and they continue to exert pressure to obtain this result.

SALES SOAR

An increase of $1 billion in manufacturers' sales during September has been reported by the Commerce Department which estimates total volume at $14.7 billion. Although part of this increase over August was attributed to higher prices, most of it comes from "gains in the actual quantity of goods moved."

Sales for the first nine months of 1947 were at an annual rate of $164 billion, a sharp advance over the rate of $118 billion in the corresponding period of last year. The Commerce Department attributes the September spurt to seasonal upswings, better production and supply conditions, ending of the summer vacation period and a slight improvement in steel supply.

Complicated Situation

In its investigation of the effects of the Fair Labor Standards Act and its administration, the McConnell subcommittee of the House Committee on Education & Labor has run into a difficult and complicated situation. It is satisfied that the law needs considerable revision, but will not attempt to make decisions of this nature until it starts work on its report to the full committee. It will get into that phase following termination of its hearings to last through the third week in November.

Industry—that is, employer—spokesmen are asking clarifications of various definitions under the act, and broadened application of exemptions from the overtime provisions. Some employers ask for complete elimination of the overtime provisions and some have gone so far as to recommend repeal of the entire act. In trying to find out whether the law or the administration of it is to blame for existing confusion and complaints, the subcommittee has found that the law itself is held as most to blame.

Nasty Situation — A really nasty

McKAY

LEVELLING & CUT-UP UNIT

ANOTHER NEW ANSWER TO AN OLD PROBLEM

A Roller Leveler and Rotary Drum Type Shear, (Utilizing Geneva Motion) are combined to produce cut to length strip from the coil.

Delivery Speed 120 feet per minute

Lengths are variable from 2 to 20 feet

Compact design minimizes floor space

Rugged construction insures continuous performance

Leveler capacity 16 gage to ⅛" thickness—SAE 1020 steel

Shear capacity 16 gage x 24" or ⅛" x 12"—SAE 1020 steel

Engineered for low cost high speed production.

The **McKAY MACHINE** *Company*

ENGINEERS AND MANUFACTURERS OF SHEET, TIN, AND STRIP MILL EQUIPMENT

YOUNGSTOWN, OHIO

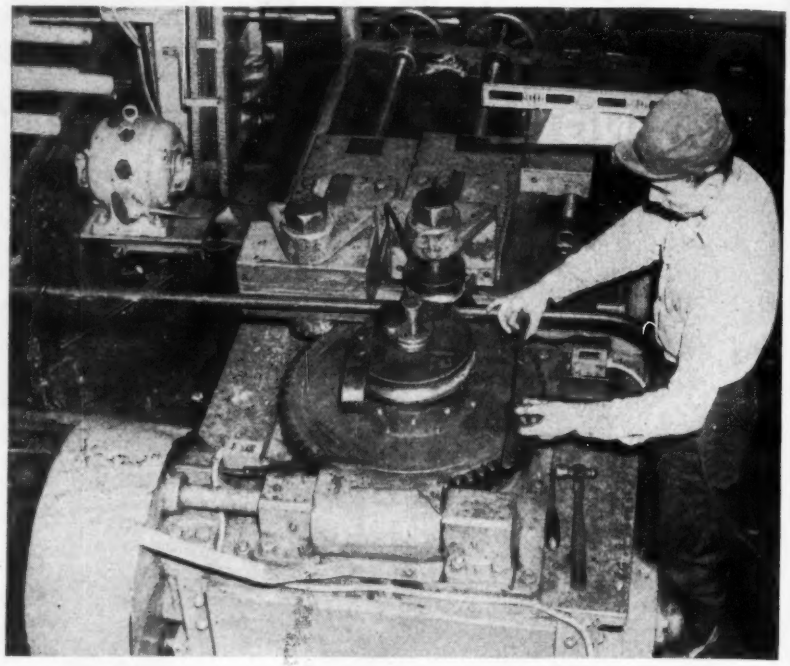
ASSOCIATED COMPANY "The WEAN ENGINEERING CO., Inc. • WARREN, OHIO

situation uncovered by the subcommittee is the serious difference of opinion between the wage and hour administrator and other government agencies in interpreting the intention behind the act. One controversy of importance is that between the administrator and the Bureau of Internal Revenue; whereas the wage-hour administrator has ruled that earnings under a profit-sharing plan are a part of wages, Internal Revenue does not permit such income to be reported as wages. In another controversy the Department of Justice has taken the position that some of the administrator's definitions of "regular pay" are illegal.

In fact, the Department of Justice is the attorney of record appearing in behalf of the employing stevedores in the "overtime-on-overtime" case now before the Supreme Court. The Justice contention in this case is that the wage-hour administrator has wrongfully included overtime pay as part of the stevedores' regular pay. Claims in this case run into the thousands, and several hundred millions of dollars are involved altogether. The Justice Department's intervention in the case stems from the fact that the claims, if allowed, would cost the government $260 million under wartime contract liability.

Another Problem—Spokesmen for the stevedoring industry told the subcommittee that unless Congress clarifies the present wage and hour law "overtime-on-overtime is likely to develop into another portal-to-portal problem." If the overtime claims are allowed, declared Walter E. Maloney, National Federation of American Shipping, "the stevedoring industry in the United States is headed for extinction through bankruptcy."

The subcommittee's task is not lightened by the fact that labor union demands are directly opposite to those of employers. The labor unions want the present overtime exemptions restricted and they want more people put under the act. Labor spokesmen also continue to drive for an increase in the minimum wage.



BENDING RADIANT HEAT: Capable of putting a 180 degree bend in 1¼-inch wrought iron pipe in 1 minute, this automatic bender, employed by Noland Co., Arlington, Va., aids in fabricating radiant heat coils for new homes near Washington, D. C. After bend is completed, the length is fitted into the complete panel and welded. Prefabricated panels are tested under 100 pounds air pressure before being taken to the building site. Installation costs are reduced as the company figures how to apply the job to the shop most economically, determining what size pipe panels would be suitable for transportation to the construction site

Defense Procurement Policy

New procurement regulations are being prepared by the Army, Navy and Air Forces and should be ready for early publication. They re-establish the conventional peacetime method of buying on a basis of competitive bids, but allow purchase by negotiation when absence of competition or special considerations make such policy desirable. Established after conferences over a period of many months, the new regulations provide for a much greater degree of uniformity in procurement methods of the three services than has existed at any time in the past. They represent a long stride toward the ultimate goal of having similar set-ups and techniques in all three services.

For the information of suppliers generally, and especially to attract bids from small businesses, the Navy will publish shortly a revision of its booklet "Selling to the Navy." It will set forth all the information about the new Navy Procurement regulations which intending suppliers need to know.

Offers Government Patents

Approximately 30 United States owned patents relating to the refining of minerals, processes for measuring gases and explosives, water survey apparatus and other processes are available to industry on a non-exclusive, royalty-free basis, Secretary of the Interior J. A. Krug has announced.

Brief descriptions of these patents are available from the Solicitor of the Department of the Interior, Washington, 25, D. C., with whom license applications should be filed.

Appoints Conservation Group

Conservation of each nation's natural resources is of international concern, Secretary of Interior J. A. Krug recently told members of the technical working committee of government officials which has been organized to assist in the planning of the International Scientific Conference on the Conservation and Utilization of Natural Resources. The conference is being set up under the direction of the Economic & Social Council of the United Nations.

The committee, of which Secretary Krug is chairman and Arthur Goldschmidt, former director of the Department of Interior's Power Division, is vice chairman, is made up of representatives of the Departments of Agriculture, Commerce, Interior, State, Defense, Federal Power Commission and Tennessee Valley Authority.

Purpose of the international conference is to exchange ideas and experiences on conservation.

Product Balance Held Chief Need On West Coast

Four-fifths of western steel consumption can be satisfied by mills in district in opinion of area industry executive

SAN FRANCISCO

NEARLY four-fifths of West Coast steel consumption can be satisfied by western mills, according to H. H. Fuller, president, Bethlehem Pacific Coast Steel Corp.

Best available estimates, he says, indicate total finished steel market requirements in the seven western states are 3.5 million tons annually. To take care of this there is about 2,750,000 tons of producing capacity in the area, and the difference between local capacity and local consuming requirements can be easily supplied by eastern mills.

Capacity Adequate—"I believe the steelmaking capacity in the western states, when combined with eastern mill capacity allocated for western consumption, is sufficient to amply serve normal market requirements in these same states," Mr. Fuller said.

"It is not possible to evaluate the need for expanded steel production for western markets without considering the large eastern steel plants which have integrated production facilities capable of making a wide range of products."

As an example, Mr. Fuller cited Bethlehem Steel Co.'s Sparrows Point, Md., plant which for many years has supplied the West Coast and currently is being expanded with the intention of continuing to supply large tonnages of the major steel requirements of the area.

Balance Needed — Mr. Fuller declared that the problem being faced by western industry is not so much a shortage of western mills' steel ingot capacity or total finished production as it is lack of facilities to produce a properly balanced variety of products required by the western market.

Mill Construction Pushed

Columbia Steel Co.'s $25 million expansion program in the San Francisco area is now expected to be completed early next year when operation of its new continuous cold reduction sheet and tin plate mill is started.

Plans of this West Coast U. S. Steel Corp. subsidiary to put the new plant into operation by the end of 1947 were disrupted by material shortages.

For a considerable time after the mill goes into operation it will produce thin sheets only, as that item is in greatest need on the West Coast. Production of tin plate will be delayed until the demand for sheets is fulfilled.

When the new mill opens it will be supplied with hot coils from U. S. Steel's Birmingham, Ala., plant, and, if necessary, from other eastern U. S. Steel plants. Deep water docking facilities are being erected at Pittsburg to handle this traffic.

Plan Changed—This plan to take coils from eastern points differs from Columbia's original intentions. When the new rolling mill was announced originally it was stated that hot coils would be supplied by Geneva Steel Co., U. S. Steel's subsidiary in Utah. However, because all of Geneva's facilities are being pushed to the limit to supply plates for pipeline projects, erection of a mill to produce hot coils has been delayed indefinitely. As soon as possible the new Geneva addition will be built and eventually will be the source of hot coils for the new Columbia rolling mill.

EXPORTS FALL

United States exports declined in September for the fourth consecutive month, the Census Bureau reports. In contrast, shipments into this country rose, thus narrowing the trade gap which concerns the world because of the inability of foreign nations to pay for their United States purchases with proceeds of their foreign sales.

The Census Bureau estimates the value of September exports at $1,114,500,000, 3 per cent below August and the lowest since last January. Imports, however, increased 21 per cent above August to a total of $481,100,000 for September. That was 4 per cent higher than the monthly average for the previous part of this year.

Exports thus exceeded imports by $633,400,000, the smallest difference since January of this year when the gap was $582,800,000.

Steel Buyers on Coast Urge Cut In Freight Rate

Consuming industry representatives present views to ICC urging reduction in tariffs from Geneva, Utah

SAN FRANCISCO

REASONABLE steel freight rate is necessary to insure successful operation of the Geneva steel plant and to maintain the San Francisco area's expanding industrial activity, the San Francisco Chamber of Commerce declares in a statement to the Interstate Commerce Commission supporting reduced rail rates on steel moving from Geneva to the West Coast.

The plea comes at a time when the shortage of steel products on the West Coast is as critical as it ever was.

Importance Stressed — G. L. Fox, manager of the chamber's Industrial Department, who prepared the freight rate argument, stressed the economic importance of lower freight rates to the western area. He pointed out that the San Francisco Bay area's population has increased by approximately one million since 1940. To maintain this population, Mr. Fox said, industrial activity must not only remain at a high level, but must expand materially.

To show the growing need for steel products, he cited the number of new plants and expansions in the Bay area since 1940 and pointed out that many public works are required because of the growth of population and industries.

Factory Space Needed—"In addition," he said, "there is a demand for millions of square feet of space for industrial and commercial purposes which is still unsatisfied.

"The availability of a dependable source of steel such as the Geneva mill can provide goes a long way toward meeting those requirements," Mr. Fox continued. "But to insure the successful operation of the mill a reasonable freight rate is necessary."

Fourteen additional statements by steel-using industries in the San Francisco Bay area also were transmitted to the ICC and the parties in the case by Walter A. Rohde, manager of the chamber's Transportation Department.

908 Airports May Benefit in U. S. Program

Lighting systems, construction, paving and grading projects to be financed jointly by local sponsors and government

AIRPORT equipment demand is being generated by the 7-year federal aid program which provides $140.9 million to be spent in 1947 and 1948 for construction or improvement of 908 airports, 896 of which are within the continental boundaries and 12 in Alaska, Hawaii and Puerto Rico.

The 908 projects involve major lighting installations at 207 airports, construction of administration buildings at 230, paving at 285, and major grading work at 397.

Require Many Products—These projects will take in varying degree many of the metalworking industry's products applicable for airport use. Electrical materials involved include special airport lighting equipment such as beacons, runway lights, wind direction indicators, interior lighting of all standard types for hangars, shops and offices, and all of the usual power apparatus and wiring supplies such as transformers, circuit breakers, panelboards, cable and floodlights.

Buildings will require steel, hardware and plumbing, and in some instances the buildings themselves will be metal. Reinforcing bars will be needed for concrete runways, and metal fences will be used to enclose various areas. Airplane servicing equipment will be required and shops will need tools.

U. S. Provides Half—Under the program, the federal government would provide $70,706,780 for the two years and sponsors would contribute $70,235,095. While 736 of the projects would be for small airports (classes 1, 2, and 3), slightly more than half of the federal appropriations are earmarked for them. Specifically, $35,295,055 of federal funds have been tentatively allocated to classes 1, 2 and 3, while $31,274,535 of federal money would go to class 4 and larger airports.

Under the program, 83 projects had been approved as of Oct. 20 by the Civil Aeronautics Administration, and the same number of grant offers made to local sponsors. Sponsors of those 83 projects are free to call for contracts and start work whenever they desire. Federal funds for the 83 projects total $10,622,223. Number of projects in Washington for final approval as of Oct. 20 was 102. Many more projects are in regional and district offices of CAA for processing.

Framework for new terminal is erected at a large Midwestern airport. New buildings may be constructed at 230 airports by the end of 1948 under the federal aid program. NEA photo

The program encountered some delay, most of it attributable to local sponsors who had to make arrangements for engineering assistance and financing. Projects for smaller fields are now being received for approval in Washington at a faster rate than at any time during the program, which, the CAA says, indicates that as far as small communities are concerned, the bottleneck is broken.

However, as production of airport equipment is increased to meet demand, producers anticipate difficulties in obtaining sufficient steel.

Sharp Increase in Planes—Growth in number of airports in this country is indicated by the following figures from the CAA as to the number of ports in existence on specified dates:

Apr. 1, 1939	2,228
Sept. 1, 1946	4,335
Sept. 1, 1947	5,418

Meanwhile, the number of aircraft in the country jumped appreciably, as is indicated by the following figures as to the number of registered planes on specified dates:

1939	13,772
July 1, 1946	57,488
July 1, 1947	93,920

Of the 93,920 planes on July 1, 1947, 902 were scheduled air carriers. The remainder were owned by individuals, business firms, or by the federal, state, or local governments.

Five Per Cent for Electrical Equipment—In calculating probable demand stemming from the airport program, Westinghouse Electric Corp., Pittsburgh, expects 5 per cent of the expenditures will go for electrical equipment. This would approximate $3½ million a year, a decided contrast from 1946 and thus far in 1947 when domestic demand for airport equipment has been negligible. "As a matter of fact," says Westinghouse, "had it not been for a rapid increase in foreign airport business, the situation would have been quite critical. The federal airport program will correct this situation."

Prospect of installation of all-weather approach lighting systems in existing large airports appears promising, says Westinghouse.

Scarcities Bedevil Program — Commenting on the airport program, Graybar Electric Co. Inc., New York, said the largest item of lighting equipment is usually the runway lighting which requires special devices built to CAA specifications.

"Scarcity problems," says Graybar, "bedevil this program. One of the toughest electrical items to obtain is transformers. Not only general distribution transformers are required but also large quantities of special high voltage isolating transformers and current regulating transformers. Steel conduit and various forms of wiring devices which are in short supply hinder the program.

"Shortages of steel probably con-

tribute more to the slowdown of this program than any other single item."

Below Wartime Rate — Crouse-Hinds Co., Syracuse, N. Y., manufacturer of electrical products, says that while recent activity in airport lighting does not compare with that experienced in 1941 and 1942 it is expected that during the next six months the new airport program will get under way in earnest and that activity will increase constantly during the following months.

Line Material Co., East Stroudsburg, Pa., which manufactures airport lighting equipment, reports, "the demand for our type of equipment is going to continue on the increase, particularly as the federal aid program gets into operation. It will be much bigger than it was before the war."

Hangar Demand Good—Star Mfg. Co., Oklahoma City, Okla., manufacturer and erector of prefabricated metal buildings, reports good demand for airport hangars and expects the airport expansion program to make the hangar business good for about five years. Shortage of steel is a handicap.

Planning to expand its operations in the radio equipment field is the Collins Radio Co., Cedar Rapids, Iowa. While experienced in aviation communications, the company has not manufactured airport radio equipment but intends to do so. It plans to produce complete airport radio equipment consisting of very high frequency transmitters and receivers, low frequency transmitters and high frequency receivers.

Electronics Conference Told of Industry Gains

Electronics industry must shoulder its full share of responsibility for the free enterprise system and world development now that it has come of age in an era when the world's very existence depends on science, said Dr. L. V. Berkner, Joint Research & Development Board, at a meeting last week of the National Electronics Conference in Chicago's Edgewater Beach Hotel.

Declaring that the industry must solve its own problems and provide its own leadership, Dr. Berkner warned against the warborn tendency to allow government to take the lead in research direction, a tendency which is a sure road to the eventual death of the free enterprise system. He also pointed to another danger within the industry itself, the matter of patents. Some means must be found by the electronics industry, he continued, to work out an equitable plan for cross licensing in the interest of national and world good.

Walter Evans, vice president, Westinghouse Electric Corp., urged a realistic appraisal of the dangers and common-sense planning now to minimize the possibilities of armed aggression, and proposed sweeping changes in national preparedness thinking under which science and industry would be admitted to full membership, along with the military, in top-level planning councils. He suggested American security be entrusted to a military high command; a nation-wide research organization; an industrial militia to establish manufacturing procedures for science-developed devices; and an Army, Navy and Air Force adequate to test equipment in the field and to train efficient personnel.

The conference, fourth in a series initiated early in the war, was sponsored by Illinois Institute of Technology, Northwestern University, University of Illinois, American Institute of Electrical Engineers and Institute of Radio Engineers, with the co-operation of the Chicago Technical Societies Council. During the three-day convention, 42 companies maintained exhibits of electronic equipment used in research laboratories and manufacturing industries.

PREPAREDNESS

Company-wide industrial mobilization program for use in event of a national emergency has been instituted by the Koppers Co., Pittsburgh. The program, Gen. Brehon Somervell, president, said, could be extended to a nationwide scale if necessary.

Under the program every participant within an organization knows in advance what steps to take, in event of an emergency, to aid national mobilization, he said.

In connection with the program each Koppers plant has been studied so that production possibilities are known, and equipment capacities, possibilities of conversion and other details are kept up to date. Furthermore, estimates have been prepared for the raw materials that would be required for maximum output, and estimates are being made of the raw materials demands on other industries.

Electro-Motive Establishes New Research Center

Division of GM celebrates 25th anniversary with opening of locomotive development center at La Grange, Ill.

ELECTRO-MOTIVE Division, General Motors Corp., celebrated its 25th anniversary recently in ceremonies at LaGrange, Ill., which featured honoring of H. L. Hamilton, who founded the organization, and dedication of a new Locomotive Development Center to service of American railroads.

Addresses and exhibits in connection with these events told the story of the spectacular rise of the diesel locomotive to its present position on American railroads from humble beginning in the first successful gasoline-electric rail car in the early twenties.

From a one-room office in Cleveland in 1922, Electro-Motive has grown to two plants in the Chicago area totaling 2,500,000 sq ft of space in 1947. More than 4,500,000 horsepower has gone into railroad service in General Motors diesel locomotives made by Electro-Motive since the LaGrange plant opened in 1935.

The celebration brought together the chief figures in the early days of the movement toward dieselization of American railroads. Reminiscing with Mr. Hamilton, vice president of General Motors, were Charles F. Kettering, a director of General Motors and its retired research chief; Ralph Budd, president, Chicago, Burlington & Quincy Railroad; Fred G. Gurley, president, Atchison, Topeka & Santa Fe Railroad; Charles E. Wilson, president, General Motors Corp.; R. K. Evans, vice president, General Motors; and John L. Pratt, retired vice president.

The new Locomotive Development Center, which G. R. Osborn, vice president of General Motors and general manager of Electro-Motive, dedicated, is a two-story building, 146 x 389 feet. In it will be concentrated all of the personnel and facilities for future development work on General Motors locomotives.

Beyond the customary facilities for engineers and draftsmen found in a manufacturing plant, the center will have specialized equipment for research, testing and experimental manufacture.

OUT TO BREAK SPEED PLUS ECONOMY RECORDS!

The New BULLARD Type "K" Mult-Au-Matics Set the Pace For Small and Medium Sized Jobs

This new machine brings greatly increased spindle speeds and the economies of quicker indexing time to small and medium sized jobs of cast iron, steel and light metal alloys such as aluminum and magnesium. New features include:

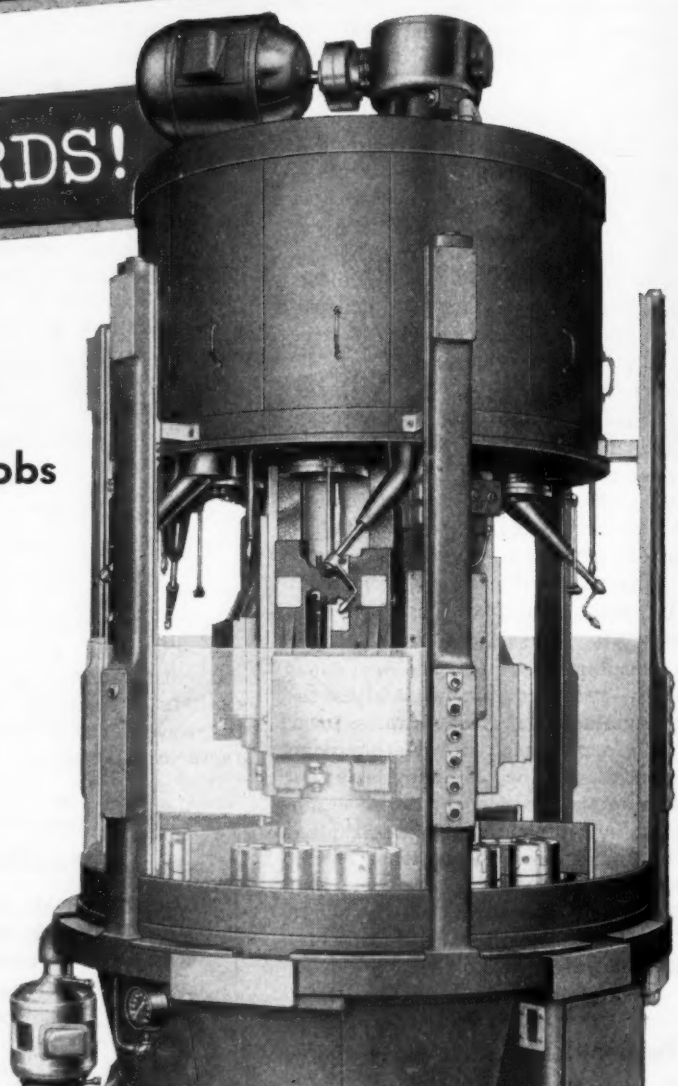
1. Higher Spindle Speeds—41 speed changes, 82 rates of feed, selective feeds and common speeds at all stations. And spindle speeds have been increased up to 900 rpm . . . *three times the speed ever before available.*

2. Less Time For Index Cycle—Chucks are automatically opened at the loading station, and closed by a foot treadle. Operator's hands are free for proper chucking, and the carrier automatically indexes when the last operating head returns to "neutral"

3. Twin Spindle Applications — Offering to small jobs a choice of advantages — two pieces for every machine index cycle, or double the production. (Single spindles available if required.)

4. Spindle Gear Synchronizing — Gear life is greatly increased by the incorporation of spindle gear synchronizers.

In design, construction and performance, the new Type "K" Mult-Au-Matic offers many advantages worth investigating for your own production . . . Write for details. THE BULLARD CO., Bridgeport 2, Conn.



The BULLARD Type "K" Mult-Au-Matics for work up to 10" in diameter, are available in four models; 6 or 12 spindles with spindle speeds at 100 to 900 rpm, and 8 or 16 spindles with spindle speeds at 98 to 883 rpm.

BULLARD

BULLARD CREATES ***NEW METHODS*** TO MAKE MACHINES DO MORE

By A. H. ALLEN *Detroit Editor, STEEL*

Mirrors of Motordom

Studebaker producing 1948 models, with changes confined mostly to radiator grille, seats and upholstery. Buick to introduce "torque-matic" transmission on largest models. Eliminates all gear shifting

DETROIT

SPECIFICATIONS of the 1948 Studebaker, now rolling on assembly lines at South Bend, Ind., will be disclosed to the public Saturday. Advance publicity pictures show the first of the new models coming down the final assembly line not more than ten car lengths behind the last of the 1947 series, indicating that no important changes in plant equipment were involved. Changes are confined principally to the radiator grille, seats and upholstery. The grille has horizontal elements which sweep clear across the front, unbroken by the vertical center section used on preceding models. Seats are reported to embody a new device, developed by L. A. Young Spring & Wire in Detroit, which permits adjustment of tension in cushion springs in accordance with the preference or weight of the individual. Upholstery fabrics have been switched to nylon, claimed to be superior from the standpoint of durability and ease of cleaning.

Studebaker production has been approximating 2700 passenger cars and 1400 trucks weekly, or about 820 daily, and the changeover will mean virtually no loss of output. Total assemblies for October were close to 19,000, of which 6000 were trucks, and this month's schedules are about the same.

The radically new body styling introduced some 18 months ago by Studebaker has occasioned much comment and speculation in the trade. The idea of almost completely "glassing-in" the area from the belt line to the roof makes for a salutary improvement in visibility for driver and passengers and at the same time has provoked some objections on the grounds that it is too much like riding in a glass showcase. Further, there has been speculation as to how strong the relatively slender steel pillars supporting the roof might be in a rollover crash. The similarity in contour between front and rear end of the body, the butt of seemingly endless corny jokes, is believed by most automotive observers to reflect the aim of designers to work out a treatment which would permit moving the engine to the rear, if such a move eventually appears advisable, without involving extensive changes in body dies.

Hudson Rings Bell

Although it has been shown only privately, to dealers, distributors, press and suppliers, the 1948 Hudson draws comment from all quarters. There is complete agreement that the company has rung the bell designwise, something which has been long overdue, but speculation turns to how much the cost will be. Gossip has the retail price at $2700.

Automobile Production

Passenger Cars and Trucks—U. S. and Canada

Estimates by Ward's Automotive Reports

	1947	1946
January	373,872	126,082
February	399,717	84,109
March	441,798	140,738
April	449,388	248,108
May	390,629	247,620
June	418,919	216,637
July	396,932	331,100
August	360,221	359,111
September	452,068	342,969
October	461,116*	410,510
November		380,664
December		380,908
12 mos.		3,268,456

* Preliminary.

Estimates for week ended:

Oct. 18	89,180	89,540
Oct. 25	106,159	87,680
Nov. 1	105,834	95,427
Nov. 8	104,000	92,760

Buick Eliminates Shifting

Utilizing the principle of the torque-converter transmission developed during the war for tank destroyers it built, Buick's new "torque-matic" transmission has been officially pronounced ready, confirming the report published here several weeks ago. It is scheduled for introduction on 1948 models to appear in January, although at first the device will be available only on the largest of the three Buick models. Described as Buick's answer to no-shift clutchless driving, the transmission is said to eliminate all gear shifting, even automatic, thus apparently being an infinitely variable type of mechanism. However, some reports have been heard to the effect models incorporating the new transmission also will carry the conventional type of gearshift, with a provision to make either system optional. General principle of the torque converter, already in use on several types of busses, is that of a three-element vaned fluid coupling—a driving member, stationary center member and a driven member. Torque is built up much more rapidly than with the two-element fluid coupling.

Straws in the wind out of Flint suggest there may have been a drastic shakeup in Buick's new model program. Originally the division was planning to make use of the new General Motors "C" body, along with Cadillac and Oldsmobile. However, in a recent press conference, C. E. Wilson, GM president, said the "distinctly different" cars the corporation is planning for production in February or March, would be in the Cadillac and Olds lines only. Commenting on the general subject of new models, he said that about six months ago C. S. Mott cautioned him after a directors' meeting, "C. E., your big job is to keep the boys from spoiling the good automobiles we are now making." There are indications of a considerable disagreement in the GM official family in the past year or two over questions of new models, styling, etc. Wilson himself has stated: "Perhaps we are a bit involved in the styling thing, as the ladies are about the length of the skirt, but we will come out of it all right."

Sees 5.5 Million Units in 1948

The GM president covered a lot of territory in his answers to questions from Associated Press managing editors here recently. He shed some light on the probable price trend when he said new models would average somewhere between no increase and 5 per cent higher. He indicated the new Kettering high-com-

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DOUBLE-JOINTED BUS: San Francisco is experimenting with articulated busses in the areas covered by the seven hills. Busses have turning front and rear wheels, pivot center wheels and are equipped with fluid drives. NEA photo

pression engines might be in production within two or three years—maybe sooner. He forecast 10 per cent higher automotive production in 1948, which would mean 5,500,000 cars and trucks. This is predicated on there being no work stoppages in the coal or steel industries, and no excessive allocations of steel for Europe, at the expense of consuming industries in this country. The increase, he added, would be confined solely to passenger cars, with trucks holding about at this year's level—1,400,000. Thus, passenger car output would increase around 15 per cent in itself, from this year's 3,600,000 to something like 4,100,000.

Prices Continue Excessive

Commenting on excessive prices being asked for slightly used cars, Wilson said: "In effect, we are selling ten-dollar bills for eight-dollar bills, and it is not surprising people act like they were tens." Here is a specific case of what is going on all over the country on this score:

In January of this year, a young friend of this writer purchased a new Pontiac 6 sedan for $1775. He drove it 19,000 miles and last month decided he would like to have a convertible model of some sort, probably because of its improved "pick-up." He noticed a new Ford convertible in a dealer's showroom and stopped in to talk over a deal. Price on the Ford was $1787 and, after looking over the young man's Pontiac, the dealer offered to trade even. Naturally, the lad jumped at the chance to get a brand new convertible for his old car without paying a dime, so he switched cars and went away happy. The next day the dealer took the Pontiac over to Detroit's used-car row and sold it for $2300, thereby netting himself a profit of about $1000 without having scarcely lifted a finger, this amount representing the spread between the manufacturer's price on the Ford, around $1300, and what he received for the Pontiac.

Kettering Not Worried

Referring to the previously mentioned press conference, C. F. Kettering, GM's retired research chief, followed Mr. Wilson and his remarks were liberally sprinkled with his usual effervescent observations:

"Science isn't ruining the world or anything else. You don't need to be afraid of the atomic bomb. It is a pretty bad thing, but we had things like that six times in the world, and if we are foolish enough to kill ourselves off, I don't think we should worry about it.

"I wonder why we can't keep from making troubles and getting so excited about what is going on today. Plan for the future, that is what the day after tomorrow is.

"I don't think we should concern ourselves too much about Europe. Sure, I am for helping the people in Europe, but I don't think we should stop our progress and go over there and try to make up these deficits. There is only one smart thing I ever did in my life—I said I would never contribute anything to a deficit.

"Nobody can get me excited about the Marshall Plan. I don't know what it is and I never asked any two people yet who knew what it was."

Pontiac Offers Hydra-Matic

Pontiac has announced officially it will have the Hydra-Matic transmission as optional equipment on all 1948 models which will be in production soon after Jan. 1. It is estimated the transmission will be provided on about 50 per cent of the cars built. Changeover schedules have been arranged so that the last 1947 models and the first 1948 model will be produced the same day, duplicating the achievement of Packard, Studebaker, Nash and others yet to come. Pontiac will show output of about 230,000 during the present model run, making 1947 the second best year in the division's history.

Hydraulic Lift Offered

The Willys jeep shortly will be available with a hydraulic lift unit designed to fit all Ferguson farm implements, and the company's sales organization will serve as distributor for these implements. The lift unit will be made by Monroe Auto Equipment Co., Monroe, Mich., and features a double-action valve which develops pressure either up or down and is operated from the driver's seat. Including steel casing, the lift weighs 60 pounds.

K-F Output Increases

October production of Kaiser-Frazer soared to 18,701, up 13 per cent from September. Of the total, 10,262 were Kaiser models. On the final day of the month a new daily production record of 862 cars was set. How K-F buyers and expediters can keep the flow of materials and parts coming into the Willow Run plant in sufficient volume to meet the steadily increasing assembly schedules is a mystery to other companies who find difficulty in even maintaining a level production pace. One answer, of course, is the bold actions which K-F has taken to insure steel supply. Acquisition of Portsmouth Steel, for example, is proving to be a lifesaver, providing about 17,000 tons of slabs a month for conversion into sheet and strip. Over half this tonnage is rolled by Wheeling Steel and the balance is rushed to any mill with open sheet rolling capacity. Much of it now will be diverted to the Chapman-Price mill in Indianapolis, purchased recently by K-F and in process of being doubled in capacity.

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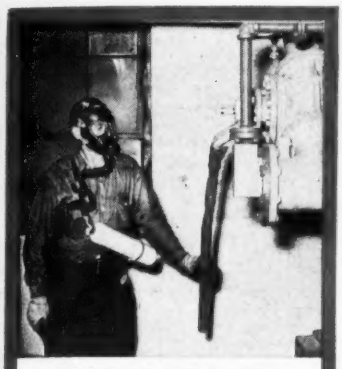

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Only the Scott has a battle-tested emergency-proved regulator.

Only the Scott has a gauge within the wearer's vision; custom-built, not a commercial gauge, to provide the maximum in utility and safety.

Write for free booklet,
"Which Air-Pak Does Your Plant Need?"

✓ COOL, FRESH AIR

The Scott Air-Pak delivers pure breathing air—not oxygen, because pure cool air gives comfort and confidence to the user; and because the use of oxygen adds unnecessary hazards, especially in the presence of petroleum vapors.

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THE SCOTT DEMAND - TYPE RESPIRATOR

WILL INCREASE WORKER EFFICIENCY

Because its "demand" air flow is truly comfortable;—no constant flow to dry out nasal and facial tissues. No breathing "against" incoming air pressure, to increase fatigue. Can be used with any half or full-face mask.

WILL SAVE ⅔ OF YOUR AIR COST;

If you now use airline respirators, because The Scott Respirator supplies air only on the inhalation of its wearer;—not a constant wasteful flow. Simply connected to plant air lines, or to commercial cylinders of breathing air.

THE PERFECT RESPIRATOR FOR WELDING, SPRAYING, SAND BLASTING, OR OTHER OPERATIONS IN OBJECTIONABLE, DUSTY, OR IRRITATING ATMOSPHERES.

Write for Free Folder "Scott 6380 Demand Respirator"

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Borg-Warner Raises Capacity In Six Divisions

Construction is part of overall program begun in 1940 which has already cost $35 million, spent or committed

CONSTRUCTION projects that will increase the manufacturing facilities of six different divisions of Borg-Warner Corp., Chicago, are under way or soon will start, President C. S. Davis has disclosed.

Current construction is part of an overall Borg-Warner expansion begun in 1940. Since then about $35 million has been spent or committed for improved or enlarged production facilities.

The Mechanics Universal Joint Division at Rockford, Ill., expects to have completed by Jan. 1 an additional 137,300-sq ft plant in Memphis, Tenn., which with complete equipment will cost nearly $3 million. This plant will produce universal joints and propeller shafts for Ford cars.

The Norge Division is increasing the facilities of its Effingham and Herrin, Ill., and Chattanooga, Tenn., plants at a cost of almost $500,000. When work is completed at Effingham, floor area will be approximately 215,000 sq ft, nearly double that contained in the factory when it was purchased late in 1945 for the manufacture of gas and electric ranges. In Herrin at the washing machine plant, floor area is being increased one-fourth, permitting an estimated three-fold increase in production. In Chattanooga, where compressor mechanisms and portable water coolers are made, facilities have been expanded and output is expected to be virtually doubled.

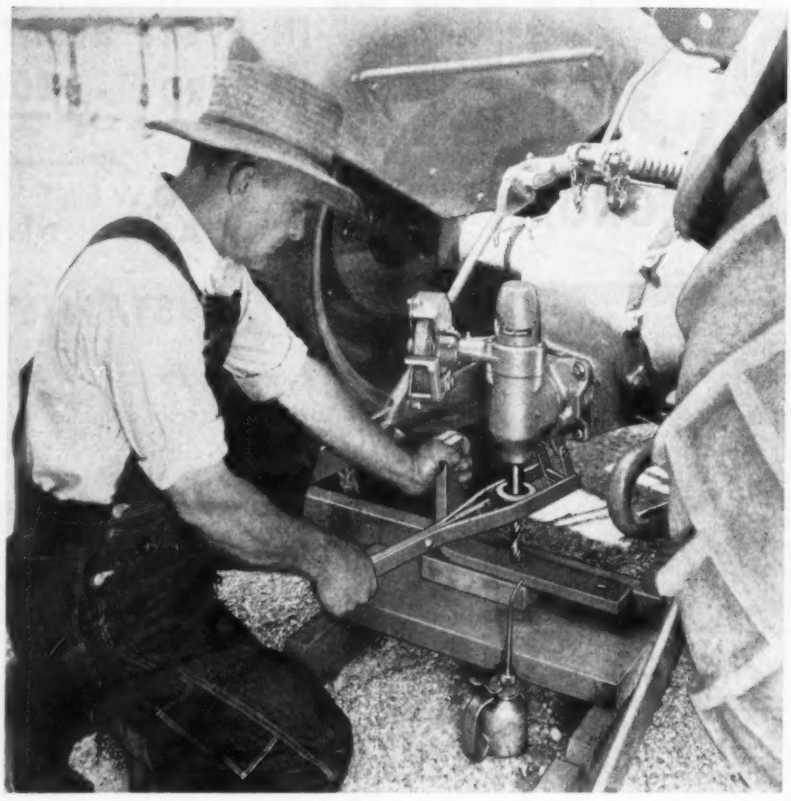
Borg-Warner's Detroit Gear Division is completing an expansion program which will increase its capacity to make automotive transmissions and put all operations in one plant.

The Borg & Beck Division, manufacturer of clutches, will relieve congestion within its Chicago plant and permit future increased production schedules by starting immediate construction of a $500,000, one-story building providing 77,250 sq ft of additional floor space. This facility will adjoin the present plant.

The Pesco Products Division is starting construction of a $120,000 laboratory on a newly acquired 35-acre site in suburban Cleveland. The laboratory will be used for testing aircraft fuel systems.

The Morse Chain Co. Division of Borg-Warner is nearing the completion of a $2 million, three-year program of rehabilitation and expansion in its Ithaca, N. Y., plant. About 50 per cent of the plant layout has been rearranged, with the addition of new machinery. Assembly and pattern departments have been reorganized to permit a better flow of materials.

In addition to Mr. Davis, officers of the corporation include: G. A. Shallberg, executive vice president; H. E. Blood, vice president; J. L. Dryden, vice president; G. P. F. Smith, vice president; and Mathew Keck, secretary and treasurer.



MOBILE FARM SHOP: A tractor-operated machine shop, mounted on the splined shaft of a tractor power take-off, is the Sherman Farmcrafter. It enables a farmer to make repairs, sharpen tools and do simple tasks on the work site. NEA photo

Give Awards in $200,000 Lincoln Welding Program

James F. Lincoln Arc Welding Foundation, Cleveland, has announced the awards in its $200,000 Design-For-Progress Program.

The first main award of $13,200 was divided among Paul F. Hackethal, Clarence C. Mast and Douglas W. Hamilton, all of Koppers Co., Aeromatic Propeller Department, Baltimore, for their paper describing how welded design of a propeller hub overcame cost and strength problems. The second main award of $10,700 went to Kiser E. Dumbauld, Bureau of Ohio Bridges, for his paper on the redesign to welded construction of three of Ohio's bridges. The third main award of $8200 went to G. J. Storatz, Heil Co., Milwaukee, for his article describing the redesign to welded construction of his company's Trailbuilder.

Youngstown To Expand Coke Production in Chicago Area

Youngstown Sheet & Tube Co., Youngstown, has authorized immediate expansion of coke production in the Chicago district. Contracts will be awarded for construction of 75 additional coke ovens at the Indiana Harbor plant, increasing production about 35,000 tons per month.

The expansion will balance the coke supply with increased pig iron capacity in the Chicago area. One of the Indiana Harbor blast furnaces will be rebuilt next spring and its capacity increased from 800 to 1400 tons per day.

BRIEFS . . . .

Paragraph mentions of developments of interest and significance within the metalworking industry

Lukens Aluminum Co., Dayton, O., has been newly formed as a producer of aluminum alloy die castings by R. E. Lukens, president of Central Tool & Die Co., also of Dayton.

—o—

Copperweld Steel Co., Glassport, Pa., has received the second place safety award in the nonferrous metals division from the National Safety Congress.

—o—

Hewitt Rubber Division, Buffalo, Hewitt-Robins Inc. has appointed Industrial Supply Co., Minneapolis, as a distributor for the entire Hewitt line of industrial hose, belting and packing in Minnesota and North and South Dakota.

—o—

Cuyahoga Works in Cleveland of the American Steel & Wire Co. held open house last week to the families of the 3400 employees and by the close of the day nearly 15,000 poured through the gates.

—o—

Lukens Steel Co., Coatesville, Pa., reports that about 6000 people went on guided tours of its and its subsidiaries' plants during the first postwar plant visitation held in September and October.

—o—

War Assets Administration is offering for sale or lease a shipyard on a 55-acre tract in Chester, Pa., which was operated during the war by Sun Shipbuilding & Dry Dock Co.

—o—

Truck-Trailer Manufacturers Association Inc., Washington, predicts that the industry will produce 65,000 units this year, or 55 per cent more than the prewar record of 41,869 vehicles established in 1941.

—o—

Dravo-Doyle Co., Pittsburgh, subsidiary of Dravo Corp., engineering firm and producer of contractors' supplies and equipment, has established a branch office in Cleveland at 3400 Independence Rd.

—o—

Sennett Steel Corp., Detroit, has started work on an addition to its warehouse which will add 10,000 sq ft of floor space. Upon completion, the facility will be serviced by two cranes of 10-ton capacity.

—o—

Parker Appliance Co., Cleveland, maker of tube fittings, valves and accessories for hydraulic and fluid-handling systems, has appointed Morman Belting & Supply Co., Milwaukee, as its distributor in Wisconsin.

—o—

American Wheelabrator & Equipment Corp., Mishawaka, Ind., manufacturer of dust and fume control devices and other equipment, has established an employee savings and profit-sharing plan whereby employees with one year's service may share in a fixed percentage of the company's net income, before federal taxes. If they wish, employees may also deposit into the fund a portion of their earnings.

—o—

Allis-Chalmers Mfg. Co., Milwaukee, manufacturer of industrial equipment, is now employing over 31,000, 6,000 more than the most optimistic estimates had previously predicted for the company's postwar era.

—o—

War Assets Administration is now conducting sales in the Louisville, Ky., area of about $11,750,000 worth of surplus property, most of it being materials handling, industrial and automotive equipment.

—o—

Jessop Steel Co., Washington, Pa., has appointed Midwest Steel Sales Inc., Indianapolis, as distributor for Jessop's specialty steels in the Indianapolis district.

—o—

California Spring Co. Inc., Los Angeles, is celebrating its 25th anniversary.

—o—

M. D. Valentine & Bro. Co., Woodbridge, N. J., maker of clay brick and specialties, has changed its name to Valentine Fire Brick Co.

—o—

Ajax Flexible Coupling Co. Inc., Westfield, N. Y., manufacturer of couplings, conveyors and vibrating screens, has appointed Industrial Sales & Engineering Co., Wilkes-Barre, Pa., as its sales representative. Ajax has also announced two new coupling sizes, Nos. 403 and 505.

—o—

Beech Aircraft Corp., Wichita, Kans., has purchased for $94,000 government-owned facilities in Wichita it used during the war to augment its manufacture of bomber and fighter trainer planes.

—o—

Cincinnati Milling Machine Co., Cincinnati, reports that nearly 20,000 attended its recent open house when 47 machines which had been on display at the Chicago Machine Tool Show were shown in operation at Cincinnati's plant.

—o—

C. G. Hussey & Co., Pittsburgh, manufacturer of copper and brass products, has appointed Crawford-Mazer Inc., Detroit, as its sales agent in the Detroit area.

—o—

Ramsey Steel Co. Inc., El Paso, Tex., steel fabricating and structural engineering firm, is the new name for the former Portabuilding Inc. Ownership and management remain the same.

—o—

American Washer & Ironer Manufacturers' Association, Chicago, reports sales of standardized household washers in September totaled 354,094 units, an increase of 12.5 per cent over the previous high in June and 27 per cent above the August figure.

—o—

National Safety Council, Chicago, has granted safety awards to two plants of Columbia Steel Co., subsidiary of U. S. Steel Corp. for extended accident-free operations at the Pittsburg, Calif., works and the Torrance, Calif., facility.

—o—

Cleveland Chamber of Commerce announces formation of a new affiliate, Cleveland World Trade Association, organized as the result of the consolidation of the Cleveland Export-Import Association and the World Trade Organization. Charles J. Ewald is executive director of the trade group.

—o—

Chamber of Commerce of the United States reports the following states have legislation prohibiting or restricting secondary boycotts: California, Colorado, Delaware, Idaho, Iowa, Massachusetts, Minnesota, Missouri, North Dakota, Oregon, Pennsylvania, Texas, Utah and Wisconsin.

—o—

Budd Co., Philadelphia, has perfected a railroad disc brake which is described as a friction machine in which stationary asbestos-lined shoes grip both sides of a revolving disc attached to the axle. The device, say company officials, can stop a car running at 60 miles an hour in less than 1000 feet without discomfort to passengers.

—o—

Southern States Iron Roofing Co., Savannah, Ga., fabricator of metal roofing and maker of naval stores, has opened a $150,000 factory and warehouse at Raleigh, N. C.

The Business Trend

Industrial Rate Again Advances to New High

WITH activity in all fields forging ahead, STEEL's index of industrial production for the week ended Nov. 1 at 169 per cent (preliminary) of the 1936-1939 average established a postwar record for the second consecutive week. Operations in the basic industries, although not in all cases at their highest peacetime levels, were nearing these peaks.

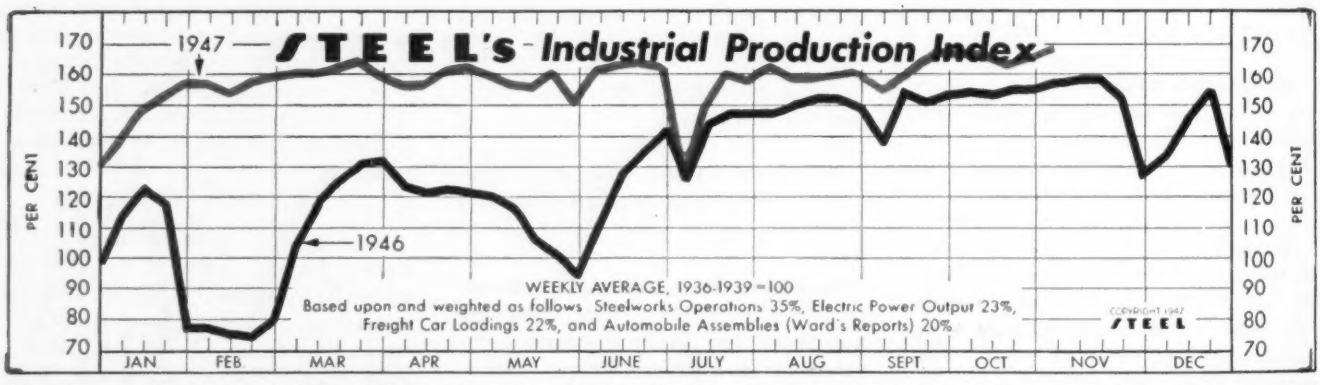
STEEL—Hindered from attainment of production in excess of theoretical capacity by shortages of basic raw materials, which threaten to force some curtailment of operations this winter, the steel industry in the week ended Nov. 1 managed to push its ingot rate up 1 point to 96.5 per cent of capacity.

PRICES—Wholesale quotations for all commodities, as reported by the Bureau of Labor Statistics, continue to inch upward, an overall increase of 0.1 per cent occurring in the week ended Oct. 25 despite lower agricultural prices. Industrial raw material prices advanced 0.6 per cent over the previous week contrasting with a 0.3 per cent decline in the prices of manufactured products.

WAGES—A half hour longer work-week in durable goods industries in September and wage rate advances in several hard goods industries pushed weekly earnings in these fields above the wartime peak for the first time since the war ended and boosted average hourly earnings of factory workers in these industries almost 2 cents an hour to 133.2 cents, according to the Department of Labor. Average weekly earnings of all factory workers advanced to $50.42 in September from $49.21 in the previous month.

NEW INCORPORATIONS—A general but small rise in the rate of new business incorporations during September is reported by Dun & Bradstreet Inc. with 6 per cent more charterings having occurred than in August. There were, however, 10 per cent fewer businesses started in September than in the same month a year ago. Business failures have been far in excess of those for last year, between three and four times as many companies failing each week as in 1946.

OUTLOOK — Sales, production and shipments continued their strong upward trend in October with no sign of letdown in the immediate future, according to a survey by the National Association of Purchasing Agents. Only 3 per cent of reporting companies show lower business than in the previous month, the smallest number so reporting this year. The majority of companies surveyed indicate that order backlogs are building up and expect good volume into next year. Buyers, however, are extremely cautious in ordering and are watching for indications of the direction the European aid program will take, wary that diversion of too much steel to Europe will adversely affect demand for components of durable goods. Growing competition is noted and prices are expected to level off.



The Index (chart above): Week Ended Nov. 1 (preliminary) 169 Previous Week 168 Month Ago 165 Year Ago 157

BAROMETERS of BUSINESS

INDUSTRY	Latest Period*	Prior Week	Month Ago	Year Ago
Steel Ingot Output (per cent of capacity)†	96.5	95.5	94.5	91
Electric Power Distributed (million kilowatt hours)	4,950‡	4,964	4,935	4,628
Bituminous Coal Production (daily av.—1000 tons)	2,105	2,102	2,050	2,127
Petroleum Production (daily av.—1000 bbl.)	5,274	5,295	5,208	4,759
Construction Volume (ENR—Unit $1,000,000)	$82.2	$141.7	$166.8	$109.4
Automobile and Truck Output (Ward's—number units)	105,834	106,159	101,608	95,427

* Dates on request. ‡ Preliminary. † 1947 weekly capacity is 1,749,928 net tons. 1946 weekly capacity was 1,762,381 net tons.

TRADE				
Freight Carloadings (unit—1000 cars)	956†	955	943	922
Business Failures (Dun & Bradstreet, number)	70	81	81	22
Money in Circulation (in millions of dollars)‡	$28,519	$28,569	$28,559	$28,588
Department Store Sales (change from like wk. a yr. ago)‡	+7%	+1%	+23%	+23%

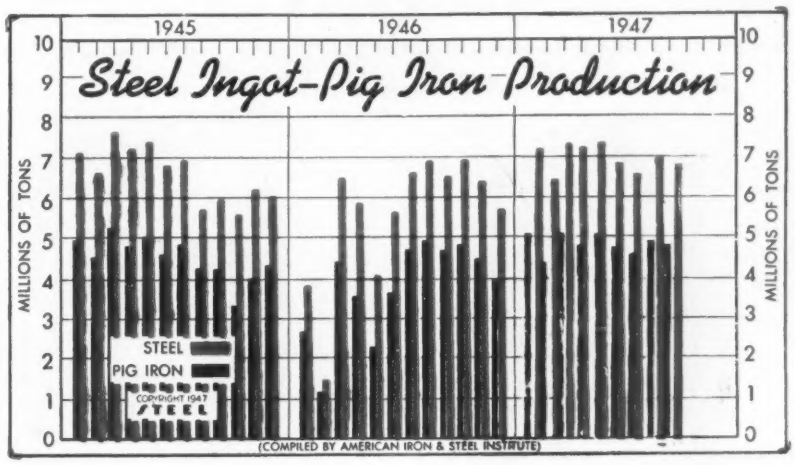
† Preliminary. ‡ Federal Reserve Board.

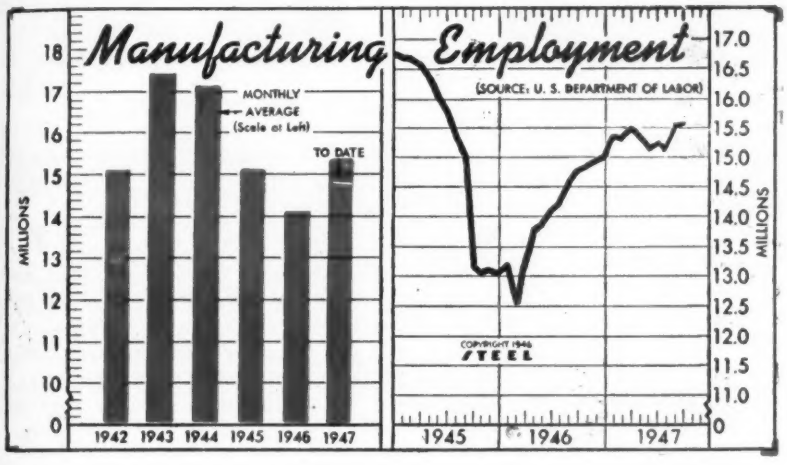
Iron, Steel Production

(Net Tons—000 omitted)

	Steel Ingots			Pig Iron	
	1947	1946	1945	1947	1946
Jan.	7,213	3,872	7,204	5,071	2,645
Feb.	6,422	1,393	6,653	4,550	1,148
Mar.	7,307	6,507	7,706	5,123	4,424
Apr.	7,043	5,860	7,290	4,830	3,614
May	7,329	4,072	7,450	5,081	2,275
June	6,969	5,625	6,841	4,810	3,682
July	6,570*	6,610	6,986	4,585	4,705
Aug.	6,982	6,887	5,735	4,917	4,898
Sept.	6,775	6,518	5,982	4,801	4,687
Oct.	....	6,910	5,597	....	4,815
Nov.	....	6,409	6,200	....	4,435
Dec.	....	5,701	6,058	....	3,992
Total	....	66,364	79,702	....	*45,379

* Adjusted.





Factory Employment

(000 omitted)

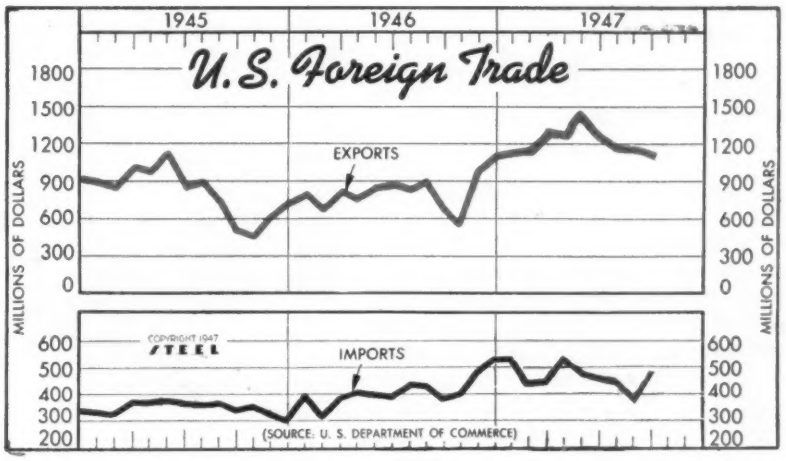
	1947	1946	1945
January	15,372	13,499	16,696
February	15,475	12,751	16,684
March	15,510	13,433	16,557
April	15,429	14,045	16,302
May	15,237	14,159	16,012
June	15,327	14,371	15,749
July	15,209	14,526	15,331
August	15,537	14,876	15,019
September	15,696	15,035	13,159
October	....	15,064	13,048
November	....	15,271	13,110
December	....	15,348	13,059
Monthly Ave...	....	14,365	15,060

Foreign Trade

Bureau of Foreign and Domestic Commerce

(Unit Value—$1,000,000)

	Exports			Imports		
	1947	1946	1945	1947	1946	1945
Jan.	1,114	799	903	533	394	354
Feb.	1,151	670	887	435	318	325
Mar.	1,327	815	1,030	444	384	365
Apr.	1,299	757	1,005	512	407	366
May	1,423	851	1,135	474	397	372
June	1,242	878	870	463	386	360
July	1,151	826	893	450	434	356
Aug.	1,150	883	737	399	425	360
Sept.	1,115	643	514	481	378	335
Oct.	....	537	455	...	394	344
Nov.	....	987	639	...	481	322
Dec.	....	1,097	736	...	536	297
Total	.....	9,743	9,804	...	4,935	4,136



FINANCE

	Latest Period*	Prior Week	Month Ago	Year Ago
Bank Clearings (Dun & Bradstreet—millions)	$13,271	$15,020	$13,580	$11,534
Federal Gross Debt (billions)	$259.0	$259.1	$259.4	$263.8
Bond Volume, NYSE (millions)	$21.3	$26.2	$23.1	$30.3
Stocks Sales, NYSE (thousands)	5,484	7,677	5,404	8,224
Loans and Investments (billions)†	$65.0	$64.6	$64.6	$58.8
United States Gov't. Obligations Held (millions)†	$38,632	$38,103	$38,680	$39,619

† Member banks, Federal Reserve System.

PRICES

STEEL's composite finished steel price average	$75.41	$75.41	$75.41	$64.45
All Commodities†	158.0	157.9	156.2	135.9
Industrial Raw Materials†	177.0	176.0	171.1	153.0
Manufactured Products†	150.6	151.1	150.9	131.7

† Bureau of Labor Statistics Index, 1926=100.

Men of Industry

PATTERSON S. WEAVER

CHARLES H. HALFORD

WALDEMAR NAUJOKS

Patterson S. Weaver has been named assistant to general superintendent, South Chicago works of Carnegie-Illinois Steel Corp., subsidiary of U. S. Steel Corp. **Kenneth J. Mortimer** has been made superintendent of the plant's production planning department, succeeding Mr. Weaver, who joined this subsidiary company 14 years ago as an industrial engineer in the company's Pittsburgh district operations. Mr. Weaver left the position of assistant superintendent of production planning at the Duquesne plant in 1943 to take a similar position at South Chicago works. A few months later he became superintendent of the department.

—o—

William B. Prosser has been named general manager of the Perfect Circle Corp., Hagerstown, Ind. Mr. Prosser became sales manager of replacement sales for the General Piston Ring Co. in 1925, and when this company was absorbed by Perfect Circle in 1928 he was made manager of the Tipton plant. He later became sales manager of the Manufacturers Sales Division, and since 1943 has been general factory manager for all the company's plants.

—o—

Robert B. Neuman has been appointed director of publicity and advertising, Vapor Car Heating Co. Inc., Chicago. Prior to becoming associated with the company, he was assistant advertising manager, Nordberg Mfg. Co., Milwaukee.

—o—

C. H. Menge has been appointed vice president in charge of sales, Murray Corp. of America, Detroit, and **F. E. McGary,** vice president in charge of operations. Mr. Menge has been associated with the corporation in sales work for the past 15 years, and has been general sales manager. Mr. McGary joined the Murray Corp. in 1940 as manager of the Engineering & Mechanical Division, and was promoted to the position of operations manager in January, 1947.

—o—

Charles H. Halford has been appointed assistant export sales manager, Harbison-Walker Refractories Co., Pittsburgh. He first became associated with the company in 1933 as a salesman in the Cleveland office, and was later transferred to Buffalo in the same capacity. His headquarters now will be in New York.

—o—

Lee S. Coulter has been promoted to manager of the Industrial Sales Division of American Hoist & Derrick Co., St. Paul, Minn. He will direct sales and merchandising for his division through the company's worldwide sales organization.

—o—

Appointment of **S. A. Crabtree** as district sales manager in charge of the Chicago sales office has been announced by Republic Steel Corp., Cleveland. He succeeds **W. J. Hanna,** who recently resigned. Associated with the corporation for many years, Mr. Crabtree has been assistant district sales manager in Chicago since 1938.

—o—

E. F. Nason has been appointed aircraft sales and product manager for Elastic Stop Nut Corp. of America, New York. During the past year and a half Mr. Nason has been a member of the service engineering department, active in the development of new products for aircraft, and will continue to devote a major portion of his time to this work.

—o—

Waldemar Naujoks has been appointed manager, Forged Valve Division, Ohio Injector Co., Wadsworth, O. He formerly had been president of the Bison Forge Co., Buffalo, and prior to that was associated with the Steel Improvement & Forge Co., Cleveland.

—o—

R. Louis Towne has been appointed sales promotion manager for Rheem Mfg. Co., San Francisco. He will make his headquarters in New York. Mr. Towne joins Rheem from Eastern Industries Inc., West Newton, Mass., where he had been sales manager of the Pump Division.

—o—

Donald L. Ande has been appointed assistant district manager, Pittsburgh district, for U. S. Steel Supply Co., subsidiary of U. S. Steel Corp. He has been a salesman in the Pittsburgh district office of the company, and before joining U. S. Steel Supply Co. he had been associated with Carnegie-Illinois Steel Corp., also a U. S. Steel Corp. subsidiary.

—o—

Pittsburgh Steel Co., Pittsburgh, announces appointment of **L. A. Ver Bryck** as district sales manager of its Chicago office, which covers the midwestern area. He has been with the company for many years, and has served as district sales manager at Pittsburgh and New York, and in January was made assistant general manager of sales, Pittsburgh.

—o—

Stanley G. Harris has been appointed chief accountant, Waukegan works,

HARPER fastening NEWS

HAVE YOU A CORROSION PROBLEM?

New Harper Computer Will Show Proper Alloy Bolt to Use

FREE
ON REQUEST TO EXECUTIVES, ENGINEERS AND OTHERS INTERESTED IN FASTENINGS

The amazing new Harper Computer provides a rapid means of selecting the best non-ferrous or stainless steel alloy fastening to resist any one of numerous conditions causing corrosion. It operates on the slide rule principle and qualifies as Excellent, Good, Fair, or No Good, 13 rust and corrosion resisting metals or alloys in approximately 142 corrosive environments. To operate it, simply, select the name of the corrosive condition which most nearly matches your own. Slide this name until it is directly opposite the arrow. Look into the adjoining column for a set of symbols which indicate the non-ferrous or stainless steel alloy best suited to resist the corrosive condition in question. For example, silicon bronze may be indicated for condition A, Monel metal for condition B, etc.

The Harper Computer is an indispensable working tool for anyone concerned with selecting alloy fastenings to meet various corrosive conditions. Write for one, now.

Harper Bolts RESIST CORROSION

Harper manufactures and stocks a vast variety of bolts, nuts, and other fastenings in all of the commercial rust and corrosion resisting alloys . . . brass, silicon bronze, naval bronze, Monel metal, and Stainless steels. Here, you are almost sure to find exactly the fastening you need.

If you have a difficult corrosion problem—one not fully answered by the Harper Computer—submit it to the Harper engineers. These men are specialists in the manufacture and use of rust and corrosion resisting fastenings. They'll be glad to study your problem and suggest a solution. No obligation.

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HARPER SPECIALIZES IN EVERLASTING FASTENINGS

American Steel & Wire Co., U. S. Steel Corp. subsidiary. He succeeds **V. N. Hossack,** who was transferred to the Worcester, Mass., works of the company.

—o—

V. Dale Wissmiller has been named western manager, Railway Controls Division, Minneapolis-Honeywell Regulator Co., Minneapolis. **Frank B. Conlon** has been engaged to manage the eastern zone, with headquarters in New York.

—o—

Samuel D. Conant, former vice president and treasurer, has been elected president of the Sligo Iron Store Co., St. Louis, succeeding his brother, the late **George L. Conant. L. W. Beer,** formerly secretary, has been elected secretary-treasurer. **J. J. Nash,** former sales manager, has been named vice president in charge of merchandising, and **Charles E. Harding,** of the sales department, was made vice president in charge of sales.

—o—

Dale W. Patrick, metallurgical department, Jones & Laughlin Steel Corp., Pittsburgh, has joined the personnel of the Colona Division, Pittsburgh Screw & Bolt Corp., Pittsburgh.

—o—

Dr. John R. Nielsen has been appointed associate professor of metal science, New York University, College of Engineering.

—o—

Otto W. Winter, president, Acme Pattern & Machine Co. Inc., Buffalo, has been elected chairman of the Buffalo district group of the National Tool & Die Manufacturers Association.

—o—

Victor Brown, director of research and metallurgy, has been elected a director of the Kropp Forge Co., Chicago.

—o—

Inland Steel Co., Chicago, announces that **W. W. Smith,** assistant vice president and manager of sales, Plate & Shape Division, will retire Nov. 15. **John J. Bohnen** will become manager of sales, Plate & Shape Division, and **Lawrence E. Chamberlain** will become assistant manager. Mr. Smith has been with Inland for 21 years.

—o—

Dr. Albert W. Hull, assistant director, Research Laboratory, General Electric Co., Schenectady, N. Y., and **Dr. Richard W. Porter,** special project engineer in the Marine & Aeronautics Engineering Division, were among 13 scientists who received honorary degrees from Yale University in connection with the celebration of the centennial of Yale's Sheffield Scientific School at New Haven, Conn.

—o—

Fred Knisley, a veteran of 25 years with Tamms Silica Co., Chicago, has been elected a vice president in charge of the Foundry Division of the company. He also was appointed vice president of the Flooring Division.

—o—

Lee H. Benson has been elected vice president in charge of manufacturing for Tuthill Pump Co., Chicago. He comes to Tuthill with a background of mass production experience over the past 40 years with such organizations as General Motors Corp., Detroit, Westinghouse Electric Corp., Pittsburgh, and Willys-Overland Motors Inc., Toledo, O.

—o—

George Stern, formerly chief metallurgist, American Electro Metal Corp., Yonkers, N. Y., has been appointed director of research for the corporation.

—o—

Leicester L. Lewis, vice president of the Tabor Mfg. Co., Philadelphia, has been named director of sales. Mr. Lewis, whose father, **Wilfred Lewis,** was president of Tabor until he retired in 1928, joined the company in that year. After several years spent on the assembly floor and in sales, he became an officer of the company with headquarters in Philadelphia, where he has remained in executive roles.

—o—

Arnold M. Lenz has been appointed executive assistant to the general manager in charge of all manufacturing at Pontiac Motor Division of General Motors Corp., at Pontiac, Mich. Most recently with the Chevrolet Division as general manufacturing manager of its Cleveland division, Mr. Lenz started with Buick in 1916, going to Chevrolet in 1919, where he remained until appointed to his present position.

LEICESTER L. LEWIS

—o—

James H. Barnes has been named assistant to **Charles Carroll,** head of the body department of the purchasing office, Ford Motor Co., Dearborn, Mich. He will join the company Dec. 1, and will continue in this position as assistant until the completion of purchasing for the 1948 series of Ford cars. At that time, Mr. Carroll plans to retire and Mr. Barnes will take over full responsibility for the department. Retirement will end more than 30 years of service in the Ford purchasing organization for Mr. Carroll. Mr. Barnes has been assistant sales manager of the Automotive Division of the Budd Co., Philadelphia, since 1943, and associated with that company since 1916.

—o—

Albert T. O'Neill has been elected president of the Niagara Falls Power Co., Niagara Falls, N. Y. He succeeds the late **Paul A. Schoellkopf.** Mr. O'Neill is also president of the Buffalo Niagara Electric Corp., Buffalo.

—o—

Clyde A. Sluhan, Anderson Oil Co., Portland, Conn., has been appointed manager of industrial sales.

—o—

Roy W. Bennett, until recently sales manager, Foundry Division, Metro-Nite Co., Milwaukee, has joined the staff of the Hydro-Blast Corp., Chicago. Mr. Bennett in past years has also been connected with the American Steel Foundries, Indiana Harbor, Ind., and the Harry A. Dietert Co., Detroit.

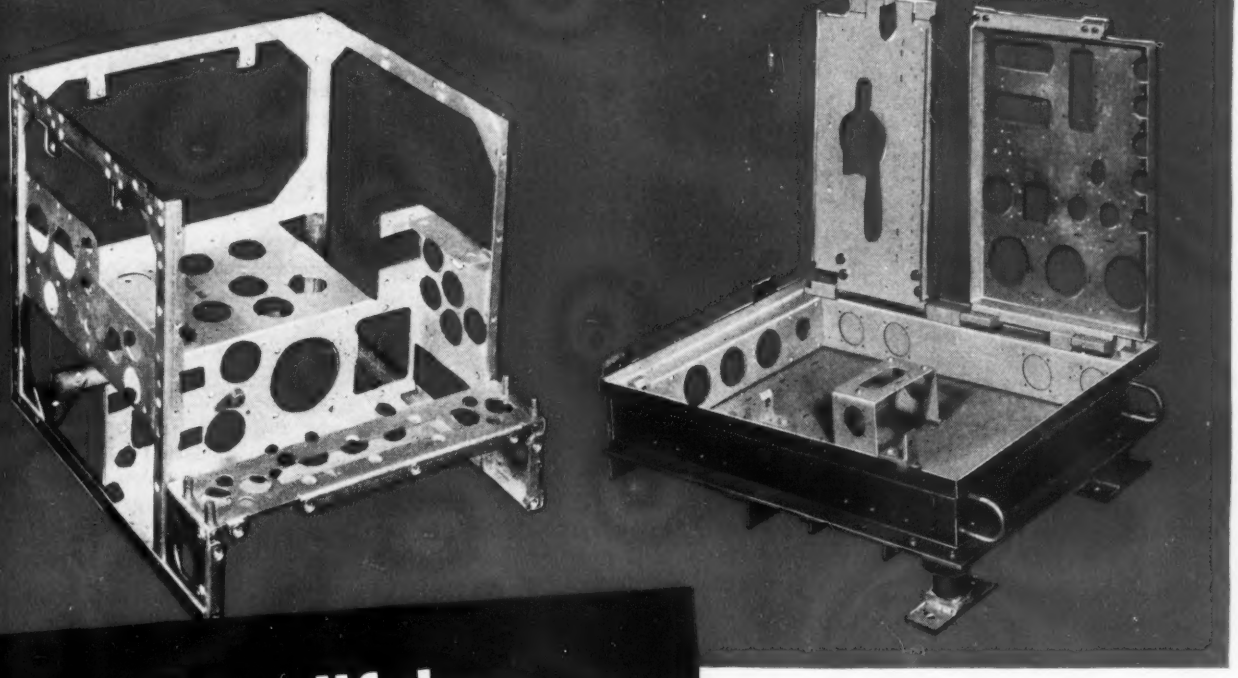
—o—

For the second year in succession, **Julius Heuschkel,** welding specialist at Westinghouse Research Laboratories, Westinghouse Electric Corp., Pittsburgh, has won the $750 first prize in the annual contest of the Resistance Welder Manufacturers Association. The 1947 award honors Mr. Heuschkel for his paper on metallurgical aspects of carbon steel spot welding.

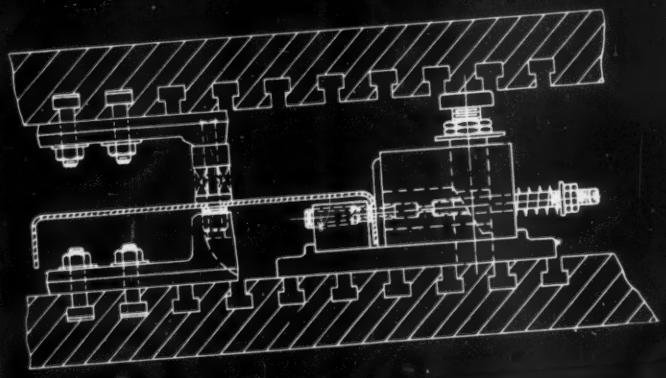
—o—

H. A. Bartling, assistant manager, industrial sales department, Allis-Chalmers Mfg. Co., Milwaukee, has been made manager of the newly formed electronics section, which incorporates sales and engineering functions of the former rectifier section

WHISTLER ADJUSTABLE DIES...USED BY OVER 1000 MANUFACTURERS



Simplifying Complicated Piercing Operations...



LEADING manufacturers find it fast, simple, accurate, and economical to use Whistler adjustable dies for the tough jobs. Complicated patterns can be set up quickly. It's easy to change hole arrangements too...without waiting and at no extra die cost. New HU-50 units, that pierce at 90° angle, can be used in conjunction with standard perforating equipment. Fewer press operations are necessary.

Savings, through continued re-use of the same dies in different arrangements on many jobs, are most important.

Whistler adjustable dies can be used in practically every type press. Standard sizes of punches and dies up to 3″ are available in a hurry. Only a few days are necessary to get special shapes made to order.

S. B. WHISTLER & SONS, INC.

756 Military Road Buffalo 17, N. Y.

HU-50 Perforating unit used in conjuction with standard Whistler adjustable dies on the same job.

For more details on this modern way to speed production and save money, write for your copies of the Whistler catalogs.

and electronic sales and engineering groups which were previously part of the control section. **L. W. Long** has been made manager of the substation section, formerly known as the mixed apparatus section, which he had served as sales engineer-in-charge.

—o—

Herman J. Mauderer, auditor and budget director of Westinghouse Electric International Co., Pittsburgh, has been promoted to the post of vice president and auditor. **Arthur L. Partridge** has been appointed assistant to the president, and **J. D. Mickle** has been named manager of the import department.

—o—

J. W. Speaker, president of the J. W. Speaker Corp., Milwaukee, manufacturer of automotive equipment, is on an extensive business trip through western Europe. He will return early in December.

—o—

Kearney & Trecker Corp., Milwaukee, has elected **Francis J. Trecker** president of the corporation to succeed his late brother, **Joseph L. Trecker. Edgar W. Trecker** has been elected executive vice president. Joseph L. Trecker, who was stricken with a heart attack in his office at the plant in October, had been elected president of the company last July to succeed his father, Theodore, who was made board chairman. The new president previously had been secretary of the company, and his brother, Edgar, had been a vice president. Both have been elected to the board of directors. **Raymond L. Bischoff,** formerly treasurer, also was elected secretary of the company.

—o—

V. P. Black has been named advertising manager of the Airtemp Division of Chrysler Corp., Detroit. He has been with the company since 1935.

—o—

At its meeting in Seattle, the Pa' ific Northwest Chapter of the Instit ite of Scrap Iron & Steel Inc. elec ed the following officers: President, **Moe Michelson,** Riverside Junk Co. Inc., Everett, Wash.; first vice president, **Leo Bloch,** M. Bloch & Co., Seattle; second vice president, **Carl Sternoff,** Sternoff Metals & Iron Works, Seattle; secretary, **David M. Sidell,** Seattle Iron & Metals Corp., Seattle; and treasurer, **Harry Sidell,** Seattle Iron & Metals Corp.

—o—

The Institute of Scrap Iron & Steel Inc., St. Louis chapter, announces election of the following officers: President, **Samuel I. Lefton,** Lefton Industrial Corp., St. Louis; first vice president, **Charles Forcheimer,** Jack R. Forcheimer & Son, St. Louis; second vice president, **Sidney Grossman,** Grossman Iron & Metal Co. Inc., St. Louis; third vice president, **Stanley Claster,** Luria Bros. & Co. Inc., St. Louis; secretary-treasurer, **George Gillerman,** Gus Gillerman Iron & Metal Co., St. Louis.

—o—

R. H. Bell has been promoted from assistant superintendent to superintendent of the bolt and nut department at the South San Francisco plant of Bethlehem Pacific Coast Steel Corp., Bethlehem Steel Co. subsidiary.

—o—

E. W. Long, claims bureau chief for Columbia Steel Co., has retired after 39 years' service with subsidiaries of U. S. Steel Corp., New York.

—o—

Philip E. Thayer has joined the executive management staff of Sterling Electric Motors Inc., Los Angeles.

—o—

F. Carroll Taylor, senior partner of the law firm of Porter & Taylor, New York, has been named a director of Yale & Towne Mfg. Co., New York. Mr. Taylor's firm is general counsel for Yale & Towne.

—o—

Maj. Gen. Roger B. Colton, U. S. A. (retired), has been elected vice president of Federal Telephone & Radio Corp., Clifton, N. Y., domestic affiliate of International Telephone & Telegraph Corp., New York.

—o—

John A. Hill and **C. D. W. Gibson,** vice presidents of Air Reduction Co. Inc., New York, have been elected to the board of directors of the company.

—o—

Carmen F. Newland has been appointed manager of the Kansas City, Mo., district, Industrial Products Sales Division, B. F. Goodrich Co., Akron.

—o—

Percy P. Morningstar has been appointed manager of the New England branch of Paisley Products Inc., with headquarters at Boston. Sam Stewart will direct the company's branch office at Philadelphia.

—o—

Kenneth A. Helmly has been promoted to the position of manager of operations, Southern States Iron Roofing Co., Savannah, Ga. He joined the company in 1938, and two years later entered military service. On his release from the Air Force in 1945, he returned to Southern States, and became assistant manager, Mail Order Sales Division, later advancing to the position of manager of that division.

—o—

N. C. MacDonald, general sales manager, Crosley Division, Avco Mfg. Corp., Cincinnati, has been elected chairman of the Household Refrigeration Division, National Electrical Manufacturers Association. He is a veteran of more than 20 years' experience in the radio and household appliance industry.

—o—

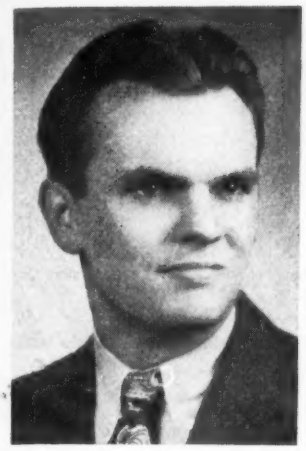
J. R. Doughty has been appointed manager of the export sales department of SKF Industries Inc., Philadelphia. He has been with the company for more than 37 years.

—o—

P. R. Hatch has been appointed sales director of Brown & Sharpe Mfg. Co., Providence, R. I., to succeed **C. W. Machon,** recently deceased. Associated with Mr. Hatch will be **H. L. Merrill,** for some years a sales

FRANK T. LEWIS
Appointed assistant manager, Schenectady Works, General Electric Co. Noted in STEEL, Nov. 3 issue, p. 86

O. W. JOHANING
Elected second vice president, American Machine Tool Distributors Assn. Noted in STEEL, Sept. 22 issue, p. 45



HARRY J. WELCH

Appointed advertising manager, Falk Corp., Milwaukee. Noted in STEEL, Nov. 3 issue, p. 86

ARTHUR NIKAND

Appointed factory manager, Portland plant, Hyster Co., Portland, Oreg. Noted in STEEL, Nov. 3 issue, p. 87

H. C. ALLINGTON

Appointed general manager of sales, Wickwire Spencer Steel Division, Colorado Fuel & Iron Corp. STEEL, Nov. 3 issue, p. 84

director, **W. Spence,** who will have special interest in screw machine sales, and **W. E. Anderson,** whose interest will be in small tools and general goods sales.

—o—

Thomas B. Cooney has been named manager of the accounting department, Meter Division, of Westinghouse Electric Corp., Pittsburgh. He succeeds **S. H. Holliday,** who has retired. Mr. Cooney previously had been assistant manager.

—o—

John F. Little, General Instrument Corp., Elizabeth, N. J., has been appointed factory manager of the corporation. He joined the firm in 1937 as chief inspector. He now succeeds **T. E. Keller,** who has resigned to become vice president in charge of operations, Florence Stove Co., Gardner, Mass. Mr. Little will be in charge of all factory operations, including production of variable condensers, automatic record changers and radio loud speakers.

—o—

Bliss & Laughlin Inc., Harvey, Ill., announces appointment of **Robert W. Ramage** as Buffalo district sales manager, and appointment of **Deppen Kline** as metallurgical engineer attached to the Buffalo plant.

—o—

W. R. Mau, western sales manager, Vanadium-Alloys Steel Co., Latrobe, Pa., and **Lynn A. Smith,** president, Lee S. Smith & Son Mfg. Co., Pittsburgh, have been elected to the board of Vanadium-Alloys Steel Co. These two new directors fill vacancies left by the late **Fred P. Underwood** and the late **T. Howe Nimick.**

—o—

Fawick Airflex Co. Inc., Cleveland, announces appointment of **Richard S. Huxtable** as executive vice president and general manager. Prior to his new appointment he had been assistant to **George W. Codrington,** vice president and general manager of the Cleveland Diesel Engine Division of General Motors Corp., Detroit. Mr. Huxtable became connected with the Cleveland Diesel Engine Division, then the Winton Engine Corp., in March, 1934.

OBITUARIES

Raymond T. Cloyes, for nearly 30 years owner and manager of Cloyes Gear Works, Cleveland, died recently. He came to Cleveland in 1910 as director of engineering research at Nela Park, General Electric Co. Later he became sales manager of Lees-Bradner Co., machine tool makers, where he remained until he went into business for himself in 1920.

—o—

J. Henry Arnold, 44, general manager, Arnold-Brown Metals & Supply Co., Birmingham, died recently. He was secretary of the Southern Chapter, American Steel Warehouse Association.

—o—

Merton T. Archer, director of research for National Supply Co. at the company's plant at Torrance, Calif., died Oct. 26 at his home in Los Angeles. During the war he was with the Army Ordnance Ferrous Metallurgical Advisory Board. Mr. Archer was a member of the American Institute of Mining & Metallurgical Engineers, American Society for Testing Materials, and American Society for Metals.

—o—

George L. Ballou, a structural steel engineer for more than 50 years, and a former official of the American Bridge Co., Pittsburgh, died recently in a New York hospital where he had been hospitalized for the past 10 years.

—o—

Alexander T. Thomson, 72, who retired as secretary-treasurer of the Phelps-Dodge Corp., New York, in 1936, died recently of a heart ailment. He had been associated with Phelps-Dodge for 51 years.

—o—

Carl E. Bjorkman, 51, a supervisor of manufacturing planning for Otis Elevator Co., New York, died Oct. 29 at his home in Yonkers, N. Y.

—o—

John H. Williams, 53, assistant manager of branch operations for Pitney-Bowes Co., Stamford, Conn., manufacturer of postage meters, died Nov. 2 at his summer home at Rowe, Mass.

—o—

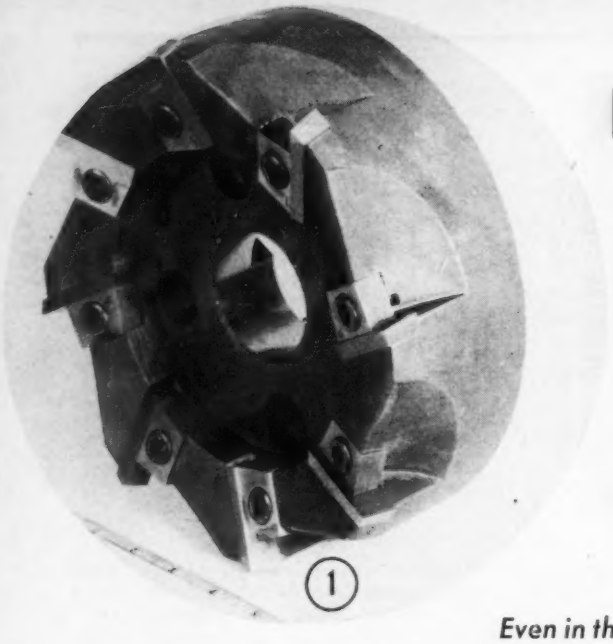
Ernest C. Baldwin, 78, an organizer and partner in the B. J. Riley Mfg. Co., Newark, N. J., died Nov. 2 at his home in East Orange, N. J.

—o—

Robert Kiffer, until a year ago president and owner of the Kiffer Tool & Die Co., Cleveland, died recently.

—o—

Raymond C. Anderson, 45, vice president of Corry-Jamestown Mfg. Co., Philadelphia, died Oct. 30. He helped organize this steel office furniture company.



RECONDITIONING *Cutting T*

FOR MAXIMUM EFFI

Even in the days when high speed steel was the "last word", reconditioning of cutters tended to create bottlenecks in production departments and to run up overhead unduly. Worse than that, subsequent performance of cutters often was far below par. In the present era of carbides all these difficulties too frequently have become intensified. In this article, an authority on carbides explains how to avoid machining trouble by applying latest tested and approved cutter grinding methods

CUTTER care and reconditioning, particularly of carbide mills is more than a problem in grinding. Because of the fragile nature of the tips or blades and the ease with which they are fractured when struck a sharp blow, special attention must be given to the proper care and handling of these tools.

This is necessarily emphasized since they differ so definitely from the customary high speed steel bits and cutters. While these too require reasonable care after sharpening, high speed steel cutting materials are not nearly so difficult to handle; nor do they require such care between the time they leave the tool room or grinding crib to the moment they are placed on the spindle of the machine.

In the first place no carbide should be set with its cutting face down on the table, bench or floor, and certainly not on the table of the machine tool. Any movement in this position and the tips or blades may be seriously chipped, spalled or cracked

Nor should a cutter with its cutting face up be used as a resting place for other tools such as wrenches, hammers, drift pins, torque wrenches and spindle nose bolts. These too with any slight movement may irreparably damage a cutting edge or even tne entire blade or tip.

If cutters are placed on shelves or racks with the cutting face up then they should be protected unless there is no possibility of other equipment being piled on them. Best of all methods is to place the cutter in a box. This box should accompany the cutter in its wanderings from the production line or machine to the tool, crib or grinding department, to the shelf or rack of the crib after grinding, and then out again. A box with a suitable sliding lid or cover is the best possible protection for these relatively expensive precision tools. The cost is negligible when compared with the damage that can be done without proper protection to the cutter itself.

The nature of these tools cannot be over emphasized; this applies to all makes of milling cutters. Either the body is a precision tool holder as in Fig. 1 with the blades ground in a jig and set to a permanent stop in a jig or to the shoulder of a fly cut; or it is a cutter as shown in Fig. 2 in which the accuracy has been ground into these blades with blades and body integral.

In either design, when the tool goes to the job to perform its function of removing metal, accuracies expressed in tenths of thousandths have been carefully and expensively worked into it. It is not at all uncommon for the grinding specification on the face of a face mill to call for tolerances of 2 to 3 "tenths" run-out. No micrometer or other sensitive measuring instrument has greater accuracy. And this kind of precision is expensive in a perishable tool. It is in order, then, to emphasize the care necessary in handling this tool while it wanders from the milling machine through its various and devious paths and back again to the machine, ready, presumably, for another round with the job.

Cost of reconditioning cutters is unfortunately covered over in that catch-all referred to as "overhead" and is, therefore, assumed to be an item that either deserves no attention or about which little or nothing can be done. On the basis of present prices the cost of reconditioning an 8-inch face mill is seldom less than $12 and frequently many times higher depending on many factors including its condition upon entering the tool grinding department. And yet one nicked or chipped blade due to carelessness means

gTools

AUMFFICIENCY

By H. A. FROMMELT
Consulting Engineer
Milwaukee

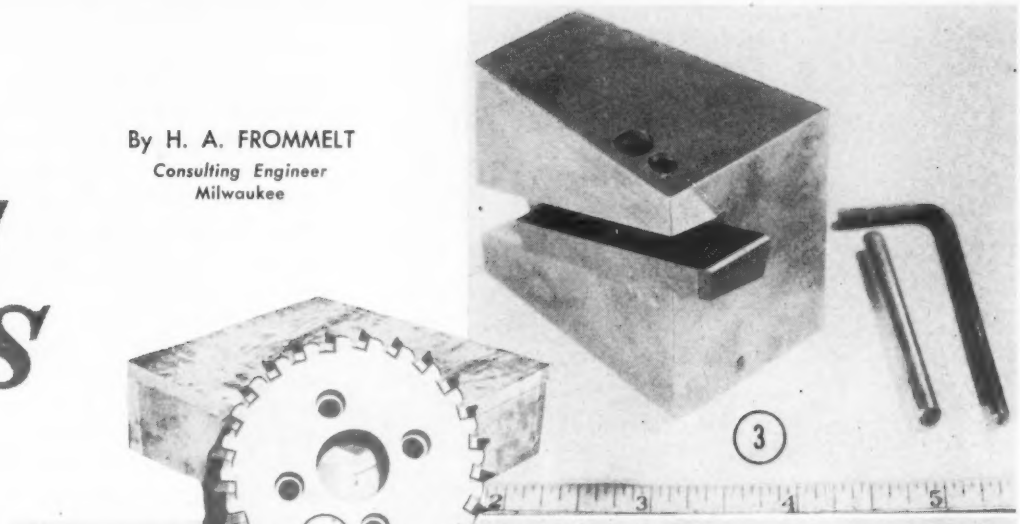


Fig. 1—Body of this cutter is a precision tool holder with blades ground in a jig and set to a permanent stop in a jig or to shoulder of a fly cut

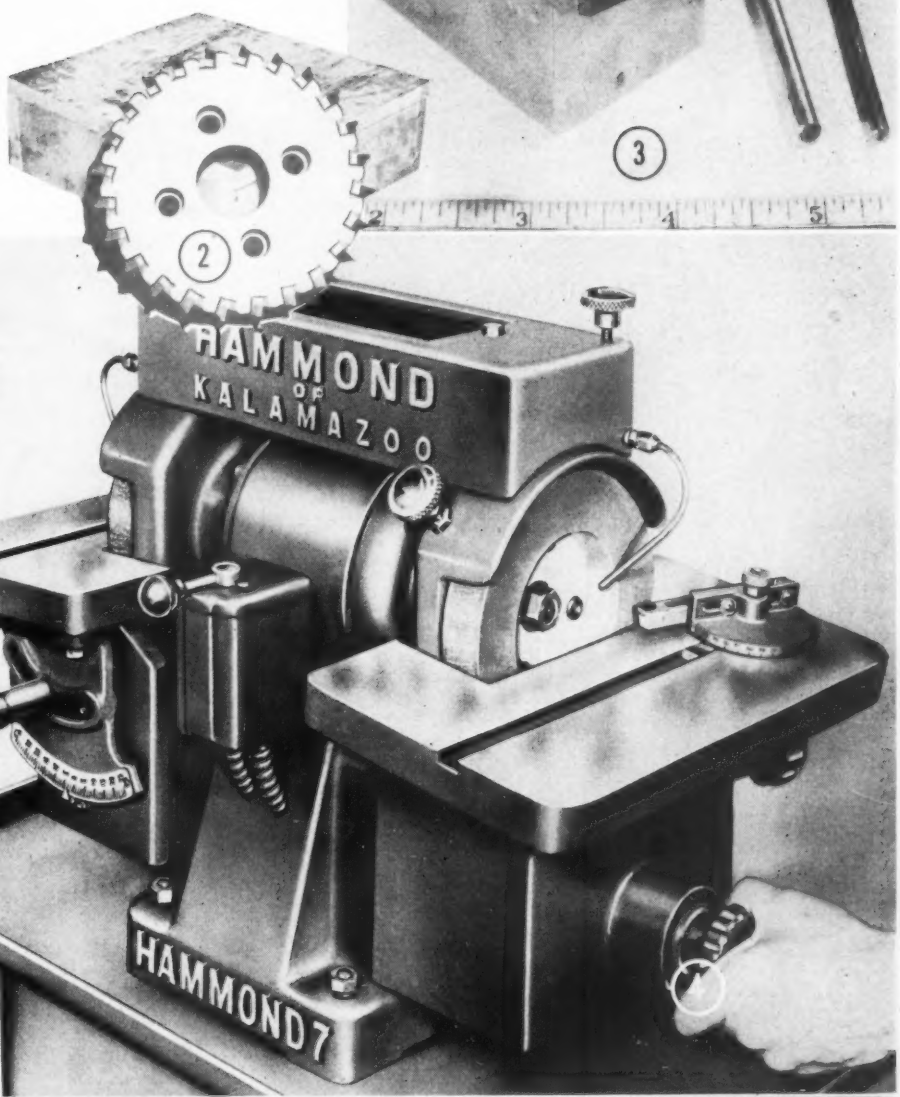


Fig. 2—Cutter in which accuracy is ground into blades; blades and body are integral

Fig. 3—Jig for grinding face mill blades

Fig. 4 — Double-wheel Hammond tool grinder in action, showing versatility of tool mounting and angular adjustment for bringing blades into contact with saucer wheels to grind them to predetermined angles

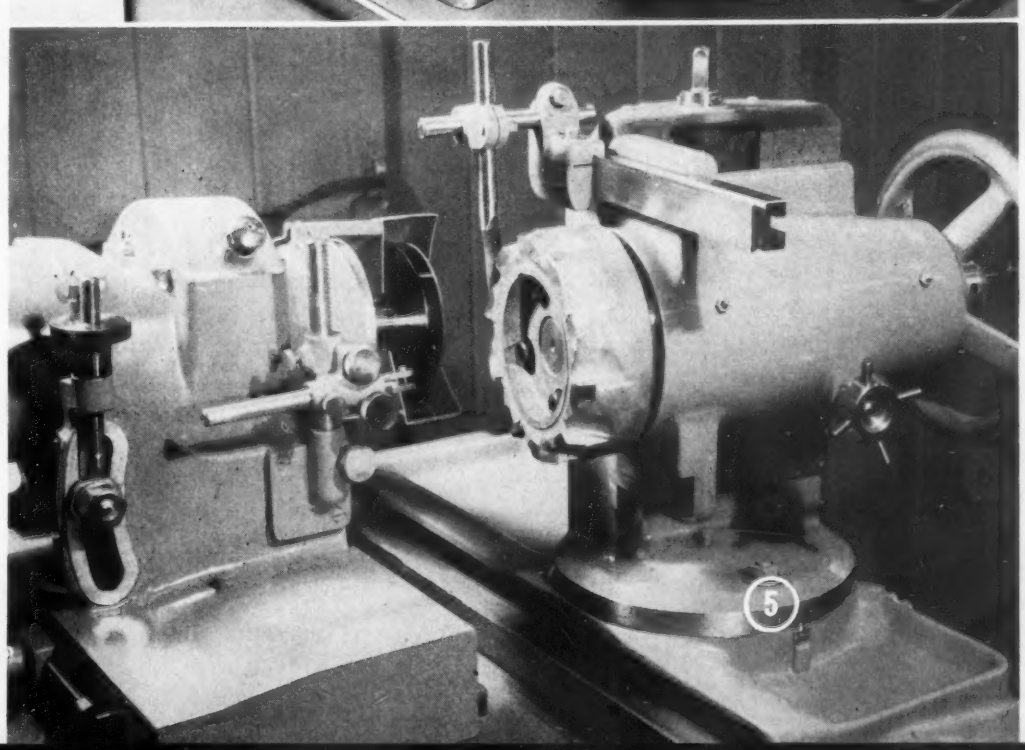


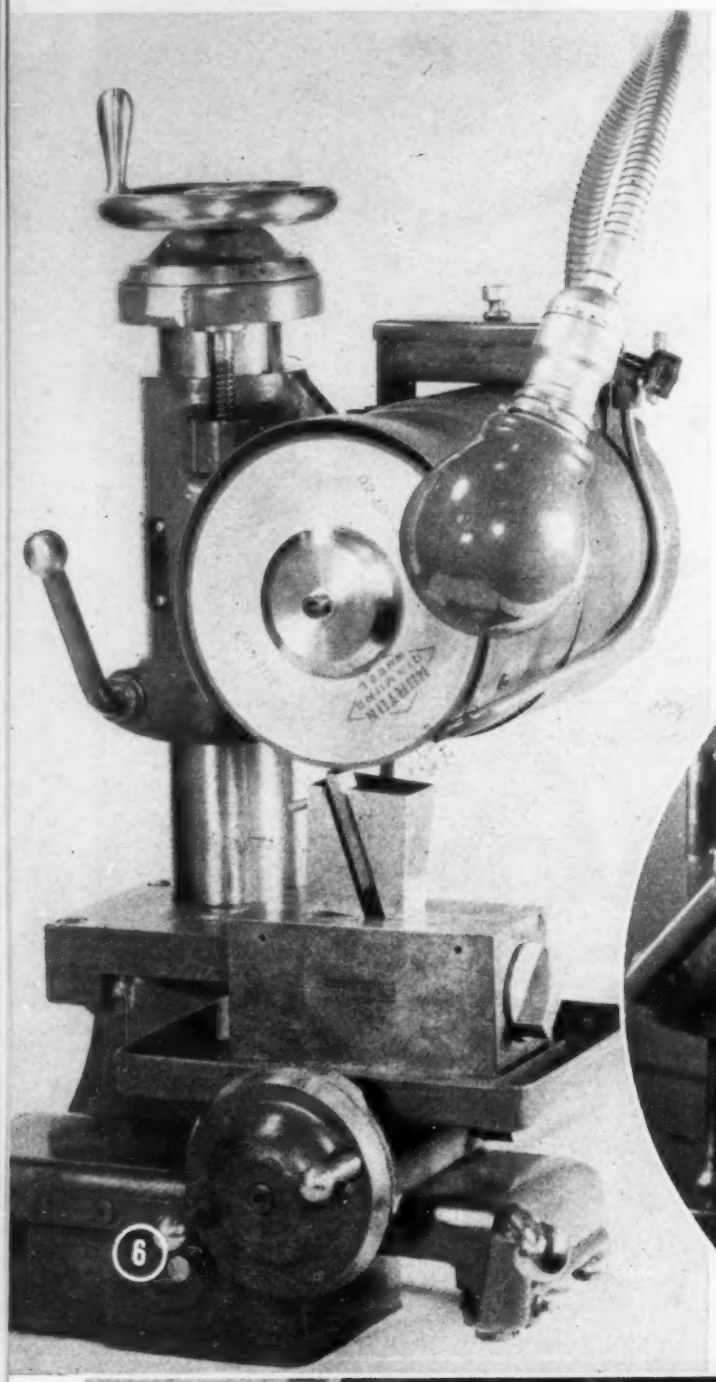
Fig. 5 — Kearney & Trecker face mill grinder

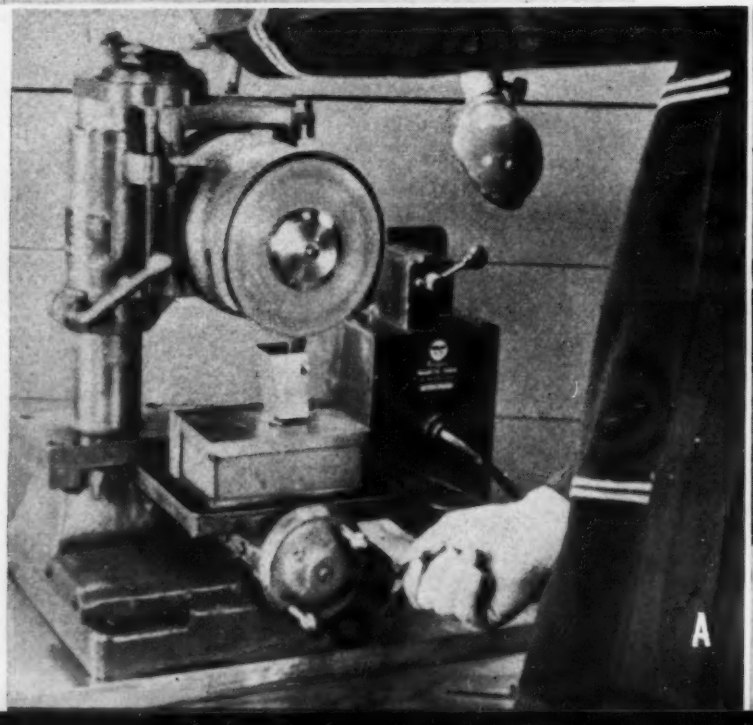
that this expense is doubled and the item appears twice in the cost data.

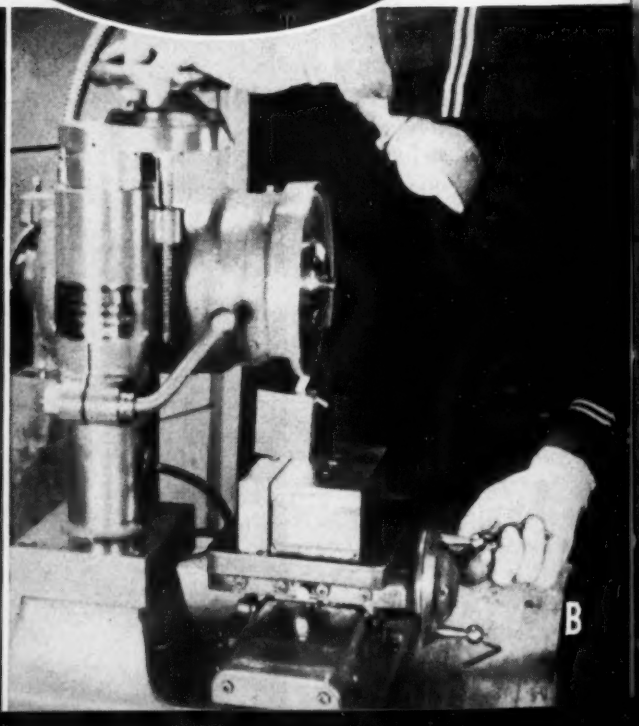
In this connection it is suggested that management give serious thought to making cutter care and reconditioning an item of direct expense instead of overhead. It is now simply and easily feasible to charge all costs of tool care and reconditioning against a specific job, as it should be, and thus bring these items into the open where they can be viewed, compared, considered and discussed.

When grinding is an overhead item there is never any possibility of its being corralled and watched, checked and filed down. As soon as it appears as an item against a customer's job, and when this is repeated for all jobs, discrepancies have a clear white light focused on them, and attention and action follow.

Cutter care and reconditioning have always been bottlenecks in milling largely because they are allowed





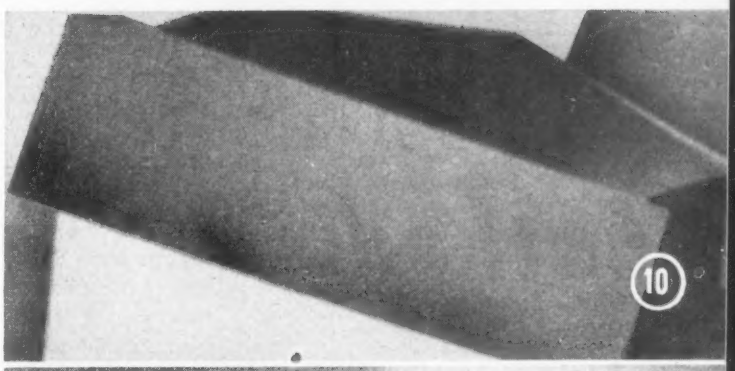


to lurk under that great big main tent of "overhead".

Good equipment for cutter grinding is important perhaps more so here than for other mechanical operations. This equipment, as illustrated in Figs. 4 and 5, must be solidly and rigidly designed and constructed so that the operation of passing an abrasive wheel over carbide tips or blades does not result in a springing away of one element from the other. It must also be sufficiently powered so that this operation of reducing tips and blades does not slow down the spindle. Variations in spindle speed result in surprising and unexpected inaccuracies.

Abrasive wheels should be purchased from reputable manufacturers and specified according to the manufacturer's recommendations. In this discussion silicon carbide wheels will be considered for all snagging operations, that is, the grinding away of the steel shank or bit to which the carbide tip or blade has been brazed. Diamond wheels will be considered exclusively for the grinding of milling cutter carbide since this operation is performed in fixed centers.

Some differences of opinion exist regarding the bond of the diamond wheel that gives optimum results. There are currently three kinds of bonds, namely, metal, resinoid and vitrified. There is now in use a modified vitrified which is sometimes considered as different from the vitrified. The experience from which this report is written, cover- (*Please turn to Page* 131)



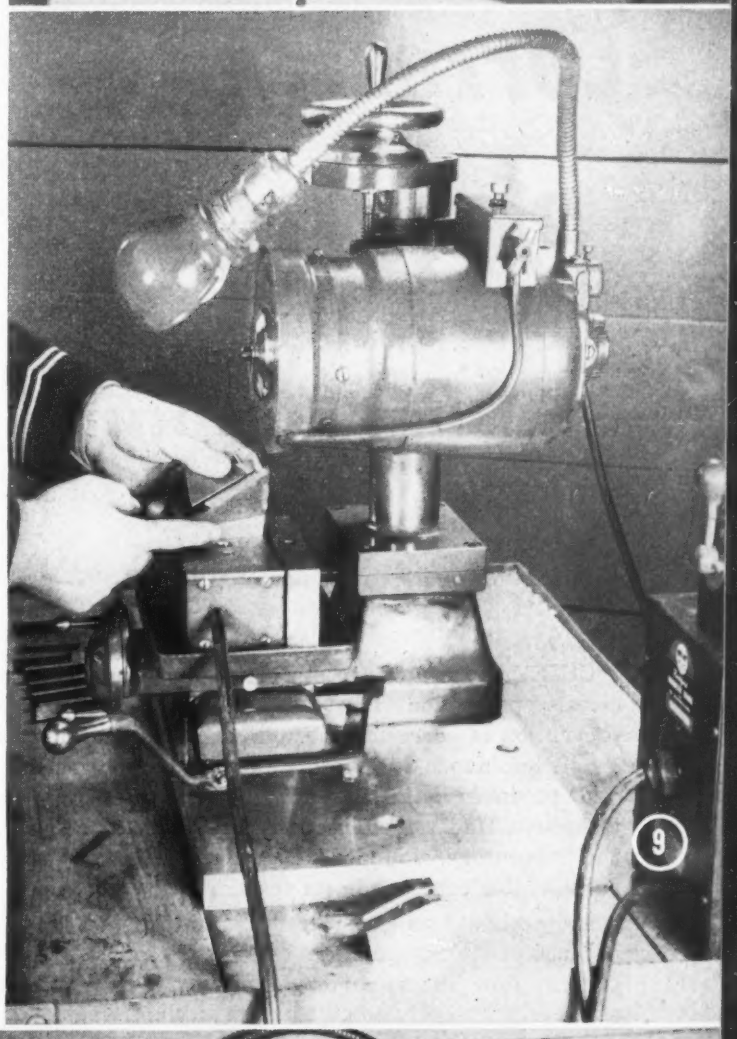


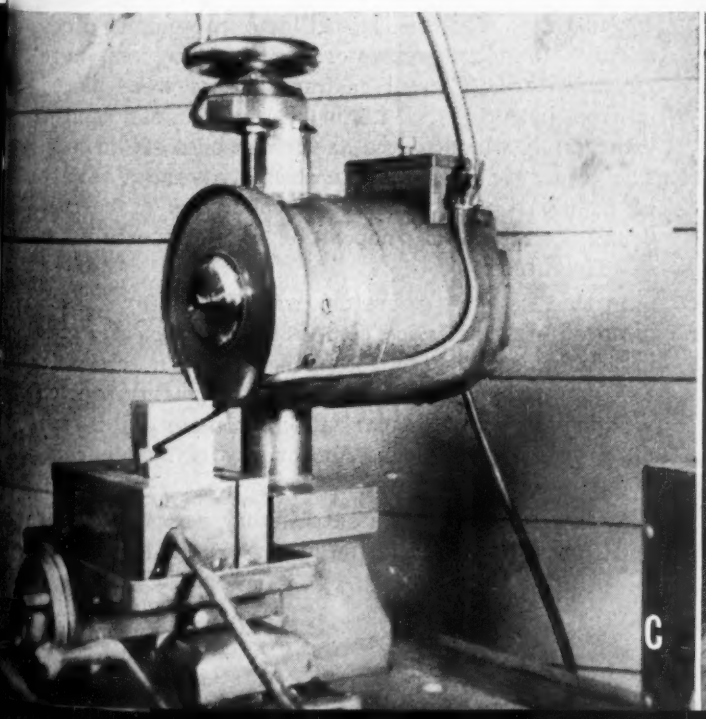
Fig. 6—Specially designed surface grinder for reconditioning cutter blades

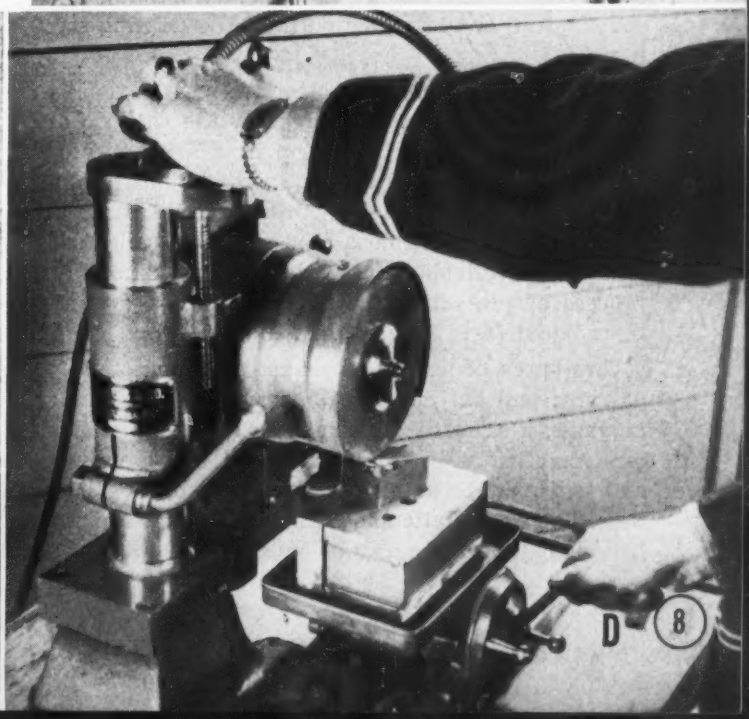
Fig. 7—Wick, in some form as shown here should at all times carry sufficient amount of solvent such as kerosene or kerosene derivative to the diamond wheel

Fig. 8—(A) Grinding peripheral clearance; (B) face No. 2 of block is used; (C) block is then positioned, automatically reproducing in the blade, angle provided in block; (D) final operation is grinding face angle

Fig. 9—Magnetic chuck shown mounted on table of surface grinder is used to hold grinding block firmly while blades are being reconditioned

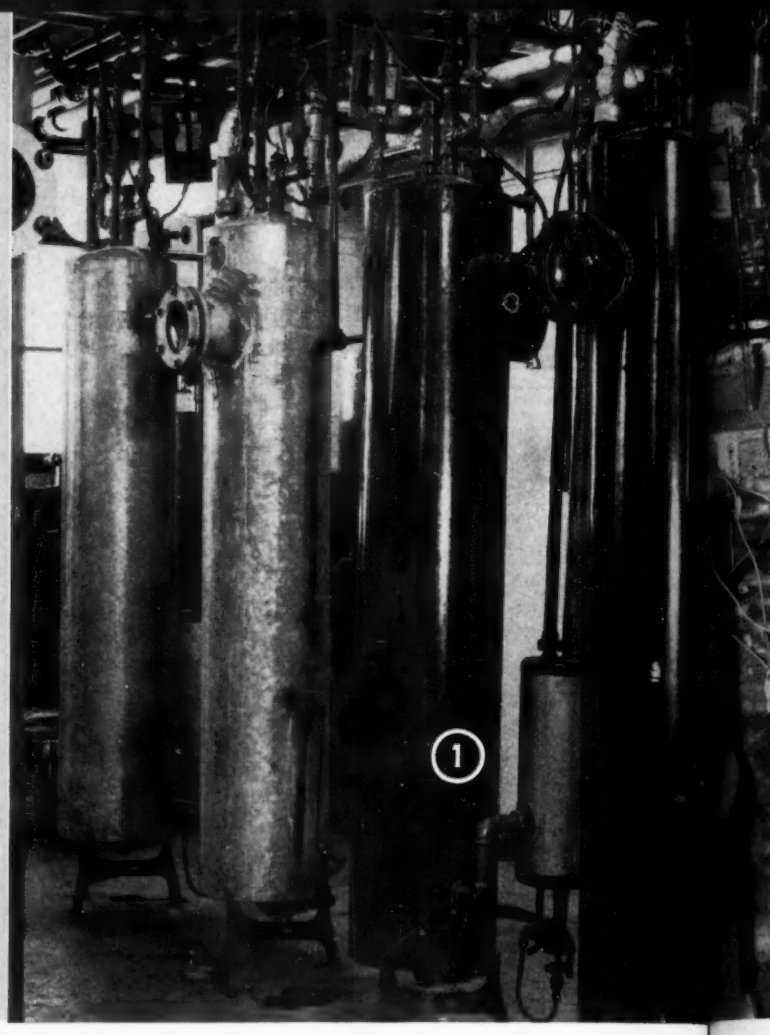
Fig. 10—Zero dish angle is shown clearly here





Cathodic Corrosion Protection

...STUDIED AT DOW CHEMICAL'S METALS PROTECTION LABORATORY



CHIEF concern of the staff at Dow Chemical Co.'s metals protection laboratory, Midland, Mich., is prevention of corrosion through use of magnesium as a galvanic anode for the cathodic protection method, and to investigate the many possibilities of this technique. Under the direction of Harold A. Robinson, the laboratory, founded in April, 1946, has made considerable progress in its research program.

Magnesium was considered valuable as an anode because of its high driving voltage. By reversing the current flow the metal could prevent weakening of structures by corrosion. The magnesium would corrode instead of the anodic parts of the existing structures.

Essentially cathodic protection means that the structure to be protected serves as the cathode of a battery. This battery is set up by placing pieces of metal called anodes in the soil near the buried structure and connecting these with a wire; the earth acts as the electrolyte. Anodes used are often called sacrificial or expendable because they are consumed in the process of protecting the buried structure and must be replaced from time to time

Two types of anodes in common use today are the galvanic and the electrolytic. Magnesium anodes are galvanic, i. e., made of a metal or alloy higher in the electromotive series than the metal to be protected, and will operate automatically when connected by a wire. The electrolytic anode usually is a mass of scrap iron or carbon and must be energized by an external direct current voltage in order to function as an anode.

New laboratory's first function was to develop a more suitable magnesium alloy and anode design for cathodic protection purposes, an anode which would last for 10 years under certain service conditions. The alloy must have a corrosion rate low enough to last and at the same time high enough to corrode without polarizing.

To do this the "pencil type" anode was used and hundreds of miniature tests were run at the same time to determine efficiency of various alloys under consideration for use in cathodic protection. Rods about 5/16-inch in diameter and 6 inches long were machined from small castings. These were placed in iron pots about 3-1/2-inches in diameter and 7 inches high, which served as the cathodes of the cells. The pots were filled with an electrolyte and a variety of tests run under controlled conditions of current density, electrolytic composition and—in some cases —temperature.

In this way the laboratory was able to investigate a large number of alloy compositions and electrolytes in a short time. The method serves as a screening test and a check on the efficiency of performance of various alloys, their polarization characteristics, type of corrosion attack and uniformity of anode composition.

Within a short time a satisfactory composition for underground anodes was (*Please turn to Page* 124)

Fig. 1—Testing anodes for home heaters includes operating various type tanks in pairs, as shown here. One tank serves as a control and other is equipped with a magnesium anode for protection from corrosion

Fig. 2—Research worker testing two iron rods partly buried in sand-filled drum to determine effect of bacteria in corrosion problems

Fig. 3—Small scale test effective in discovering secrets of corrosion is "pencil type" anode used in an iron test pot

Fig. 4—Checking condition of magnesium anodes removed from ground after being in service

Advantages of INDUCTION In Zinc

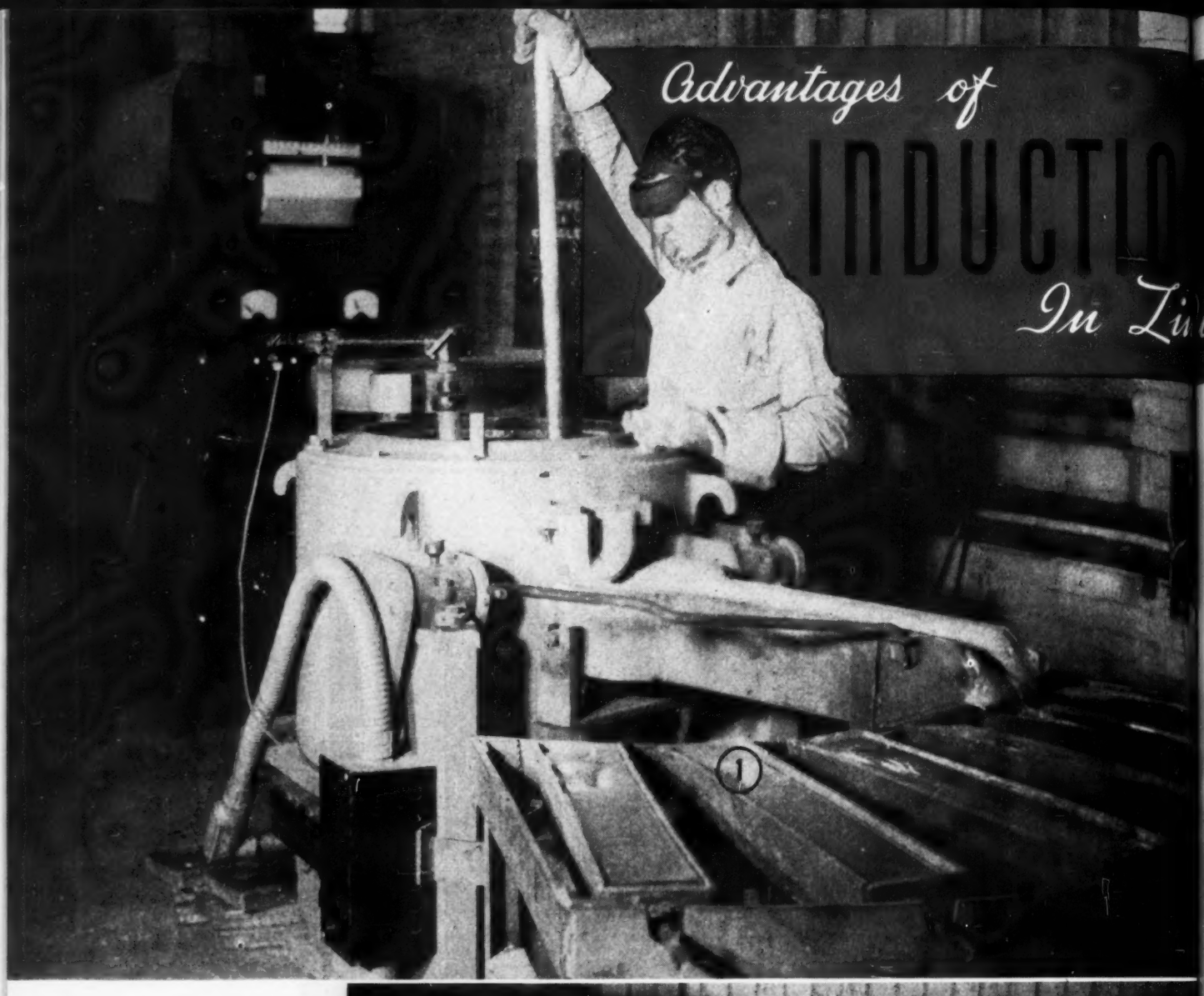


Fig. 1—Induction furnace arranged for experimental production of zinc alloy pigs. Operator is inserting bar of aluminum-magnesium "hardener" into vertical induction heating passage where high current flow melts alloying agent

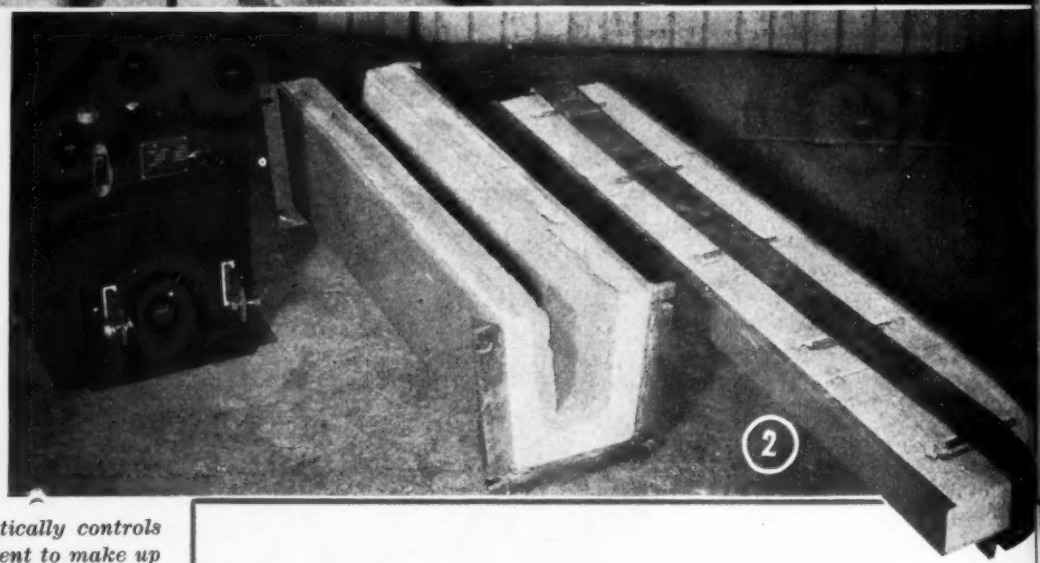


Fig. 2—Section of launder (center) and resistance-heated cover (right) for conveying molten zinc alloy from melting to holding furnaces. Unit, left, automatically controls current flow in heating element to make up for radiation losses, and keeps metal at desired temperature

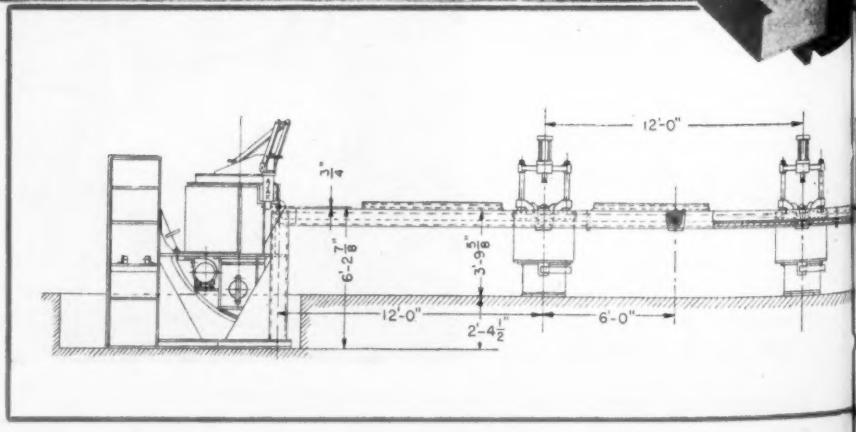
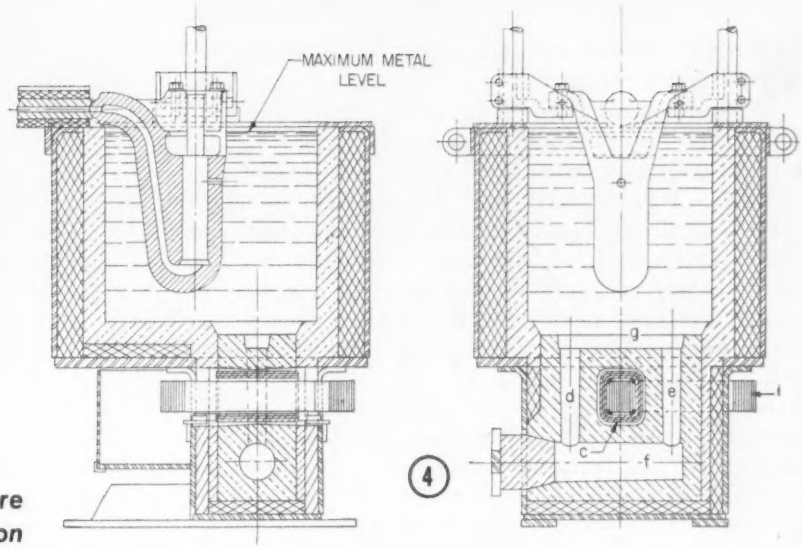


Fig. 3—Suggested layout of induction melting furnaces connected by heated launders to induction holding furnaces at die casting machines

Fig. 4—Vertical sections through 20-kilowatt Ajax induction furnace designed for holding molten zinc alloy

...URNACES ...Zinc Casting



Iron pickup and drossing losses are reduced and variations in composition minimized. Use of "hardener" rod provides convenient means of preparing alloy without pigging. Feeding molten alloy through heated troughs to many holding furnaces reported highly successful

By HERBERT CHASE

LOW frequency induction furnaces of the Ajax Tama Wyatt type are being used with noteworthy benefits in at least three sizable plants producing zinc die castings. They are being given careful study in some other die casting plants, according to Ajax Engineering Corp., Trenton, N. J. To date, furnaces of this type have gained widest use in plants die casting aluminum alloys but recent experience indicates that equal advantages are attainable in melting zinc. Convenience, economy and safety in metal handling are also attainable by "piping" molten metal from melting to holding furnaces when groups of machines must be supplied.

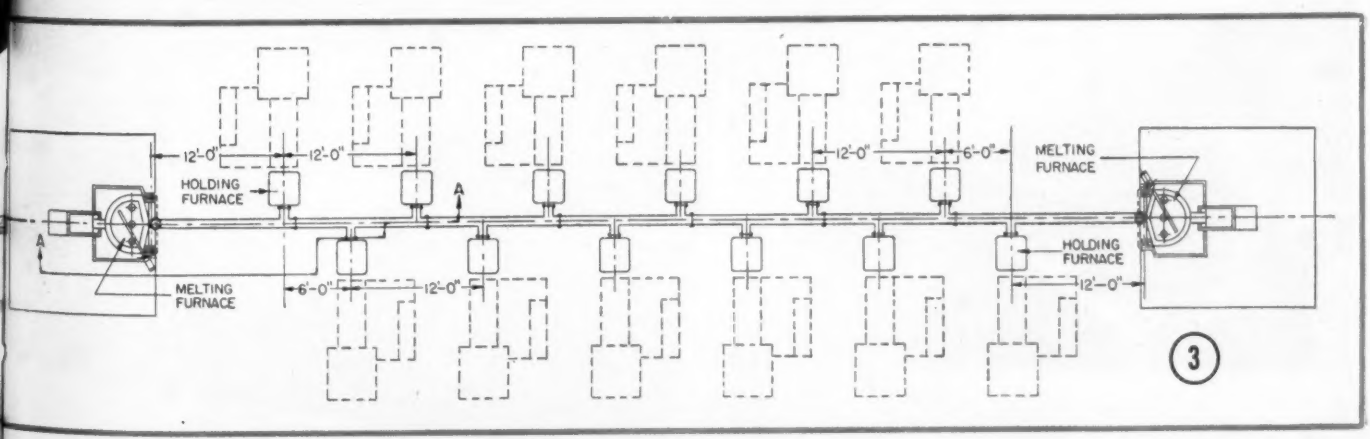
To appreciate the possibilities in this direction, it is helpful first to review how the furnace operates. Two vertical sections through a 20-kilowatt holding furnace of this type, adapted for use with zinc, are shown in Fig. 4. Ordinary 60-cycle line current is applied, through suitable control elements, to a primary transformer coil wound around a laminated magnetic core. This current induces a much lower voltage and a high amperage to flow in molten zinc which fills the passages d, e and f and space g, this metal forming a secondary "coil" of one turn.

Passages d, e and f are inside tightly rammed inert refractory (which is also a dielectric) and space g, is at the bottom of the reservoir, which is normally about two-thirds full of molten alloy, and has a refractory lining as well as heat insulation. Slab zinc or alloy ingots are melted in the reservoir except when the furnace is used only for holding purposes.

Heating metal by secondary current causes it to flow and to mix with molten metal at higher level in which the alloy iron casting, containing the conventional plunger cylinder and gooseneck passage, is partly immersed. This casting is not a part of the furnace but is supplied by the maker of the die casting machine.

When solid metal is added, there is of course, a rapid transfer of heat from the molten to the solid metal, tending to cause a temperature drop in the latter. Controls then supply full current and heat is added rapidly but always inside the metal, never through a heated well, as in combustion furnaces. As all metal recesses are well insulated thermally and, as heat flow is always from the inside, the exterior of the furnace remains cool and working conditions around the furnace are excellent. There is never any flame and no flue is required because there are no combustion products to be disposed.

This whole arrangement tends to conserve heat and electric energy and permits rapid control by electrical means. Also, it is (*Please turn to Page* 136)



FUNDAMENTALS OF OX

This article discusses basic principles of processes and describes gases and equipment in some detail. Flame hardening, softening, priming, gouging, pressure welding and steel conditioning are treated briefly

WHEN oxygen and acetylene are combined in suitable apparatus to give the oxyacetylene flame, the hottest flame temperature available to industry is produced. This can either rapidly heat or melt any metal so that a welded joint may be made. Iron or steel may be cut fast by a jet of pure oxygen impinged on the place that has been heated to its ignition point. This ignition point is below the melting point of the metal; the stream of oxygen oxidizes the metal. The process can cut or shape iron or steel as desired and under close control.

Oxyacetylene flame for heating or welding may be produced in three types by the same blowpipe, depending on the ratio of the volume of oxygen and acetylene supplied. A neutral flame is obtained by a mixture of approximately equal parts of oxygen and acetylene. This flame is used where it is desired to have no chemical or metallurgical effect on the welded metal. The flame is held in a suitable manner with the inner cone not quite touching the metal. When additional acetylene is supplied to the flame, a so-called "carbonizing" flame is developed.

A neutral flame has a distinct inner cone and an outer envelope. The excess-acetylene flame has a third zone between the inner and outer envelope, known as the excess-acetylene feather. This consists of incandescent carbon particles, some of which are dissolved in the molten metal during welding. For this reason, the flame is frequently called a "carburizing" flame. Such a flame will tend to remove oxygen from iron oxides which may be present. The third type of flame adjustment has an excess of oxygen. This is called an "oxidizing" flame because of its effect on the molten metal.

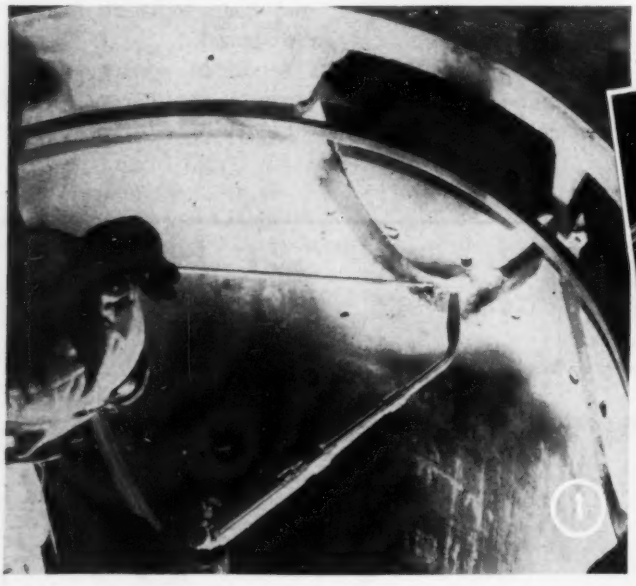
When acetylene is completely burned in ordinary air, oxygen in the air combines with acetylene to form carbon dioxide and water vapor. Combustion of the acetylene requires two and a half times as much oxygen as acetylene. All this oxygen does not come from the supply of pure oxygen. Actually about 40 per cent comes through the blowpipe. The rest of the combustion is completed when the oxygen of the air in the flame envelopes, surrounds the inner cone.

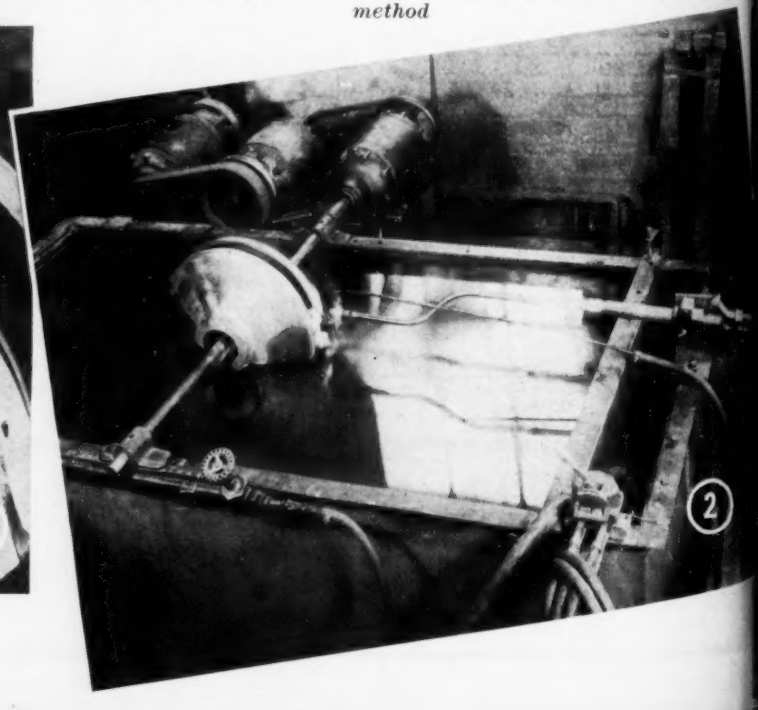
Gases: Acetylene is generated from calcium carbide, a grayish rock-like substance with the peculiar property of producing acetylene when it comes in contact with water. Acetylene is produced in generators, which usually consist of a cylindrical tank of water supporting a carbide hopper, with a fitted mechanism mounted between the two. This mechanism may be controlled by the volume of acetylene or the pressure within the generator. Interlocking connections and vents produce the necessary safeguards in handling this combustible gas. Pressure of free acetylene is limited by general rules to 15 pounds per square inch gage pressure. Acetylene generators are either portable or stationary.

When acetylene generators are not available or desirable, acetylene may be obtained compressed into cylinders which have also become a standard article of commerce. An acetylene cylinder does not contain free gas, but is completely filled with a porous material. These fine pores are then filled with acetone which has the peculiar property of dissolving many times its own volume of acetylene for each 15 pounds pressure. Under these conditions, higher pressures are permissible since the acetylene

Fig. 1—Repairing a 44-inch diameter intermediate-pressure cylinder by bronze-welding with oxyacetylene flame

Fig. 2—Oxyacetylene flame-hardening a cast iron idler wheel for belt conveyor using spin-hardening method





OF OXYACETYLENE

Welding AND Cutting

By J. I. BANASH
Consulting Engineer
Chicago

Fig. 3 — Flame gouging back side of weld in bottom plates of oil tanker preparatory to making final pass on a double-welded butt joint

Fig. 4 — Cutting a 24 x 24-inch ingot in less than 15 minutes

Fig. 5—Removing risers from cast steel side frames for heavy machine tools

is not in the free gaseous state.

Thus we find it possible to supply some 300 cubic feet of acetylene under a pressure of 250 pounds per square inch in such a shipping container. When acetylene is needed in great quantities, it is generally supplied by acetylene generators and is piped throughout the plant to convenient outlets at the various points where it is used. In some instances, acetylene cylinders are manifolded and connected to such pipe lines.

Acetylene as a chemical is a most interesting product. It has a peculiarly distinctive odor so that small leaks can readily be detected. It consists of carbon and hydrogen, with the formula C_2H_2. When burned with oxygen, it produces carbon dioxide and water vapor with a great heat because of its endothermic property. When the flame burns in air with a suitable burner, it is a close approach to sunlight, and colors may be matched in such a light.

In addition to the oxyacetylene process, acetylene has a tremendous use in the production of chemicals. It is also used for lighting marine signal buoys and still, to some extent, for farm lighting.

Oxygen is most commonly produced by fractional distillation of liquid air which separates out the main components of the air: Oxygen and nitrogen. The oxygen is compressed into the familiar high-pressure cylinders for distribution to the user. This sounds simple, but the procedure is highly technical. The oxygen supplied for welding and cutting has a purity of 99.5 per cent.

When large volumes of oxygen are needed, it is piped throughout the plant from a central supply source to convenient outlets. Oxygen cylinders may also be manifolded together and connected to a pipe line. Various specialized methods of distributing oxygen in large volumes have been developed and successfully applied.

Equipment: One of the factors which contributed greatly to the growth of the oxyacetylene processes is its simple and inexpensive equipment. In its simplest form, a welding and cutting outfit consists of a cylinder of oxygen, a cylinder of acetylene, two regulators, two lengths of hose, a welding blowpipe, and either a cutting attachment or a separate cutting blowpipe. With such an assembly, practically all commercial metals can be welded, and steel, wrought iron, and cast iron can be cut.

Blowpipes are precision-built with proper control valves so that the desired proportions of acetylene and oxygen may flow and become thoroughly mixed before issuing from the tip. The usual welding torch has a single orifice. Entirely different tips and controls are used for cutting metals. A number of orifices for the mixed gases surround a central orifice through which the pure oxygen issues to accomplish the cutting. With flames surrounding the cutting jet, the cut can proceed in any desired direction without changing the position of the nozzle.

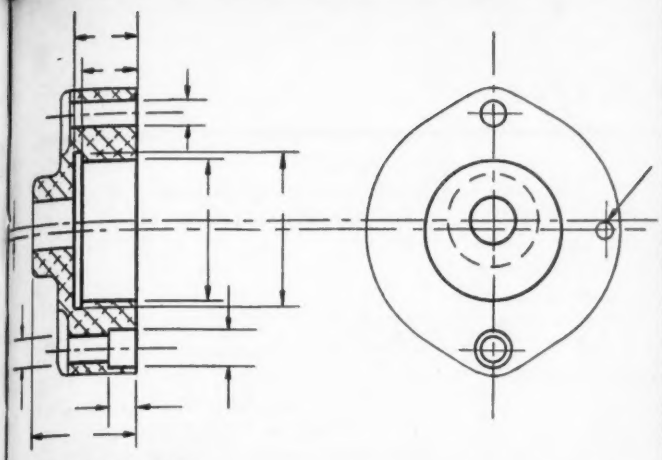
It seems obvious that one cannot and should not use 2200 pounds per square inch of oxygen, and 250 pounds per square inch of acetylene in any piece of apparatus. This high pressure is used in shipment and is not intended for use at the application point where the pressures are less than 15 pounds per square inch for acetylene, and less than 100 pounds per square inch for oxygen. To obtain precise work, the pressure should not vary. This is accomplished by reducing valves or regulators, so that suitable working pressure is under the control of the operator. These devices are also simple, but precision is, of course, needed in their manufacture and assembly to produce the accuracy needed to maintain sufficient flames.

Applications: Oxyacetylene fusion welding is most simply accomplished by bringing two pieces of metal in contact and melting them under an oxyacetylene flame. The molten metal flows until each edge is completely fused with the other. Additional weld metal is generally introduced into the joint by welding rod which is melted in the same flame. The edges of all but very thin sections should be beveled to obtain complete fusion to the bottom of the weld. Thus strong ductile joints are obtained with practically any thickness of material. Oxyacetylene welding is most readily used in automatic or semiautomatic machine operations, and is extensively used in the manufacture of steel tubing, barrels, drums, and tanks.

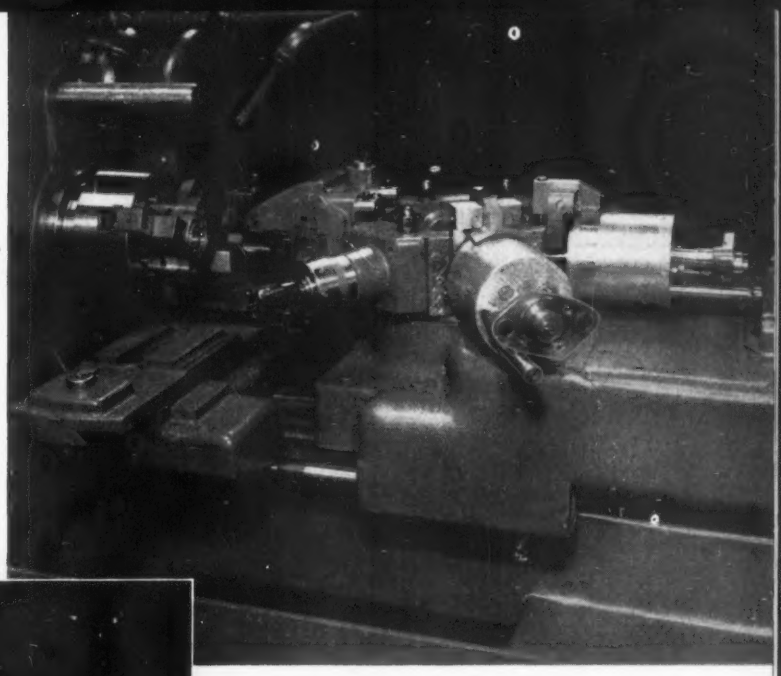
When it is not desirable actually to melt the parent metal, a sound joint may be produced by brazing or bronze-welding. This is done by heating the edges of a joint to a dull red heat and then melting a bronze welding rod in the hot metal. At this temperature the rod will combine with the base metal and form a strong bond. A bronze-welding joint is quite comparable to a fusion weld in many ways. The main advantage is that a lower temperature can be used which is somewhat easier and faster.

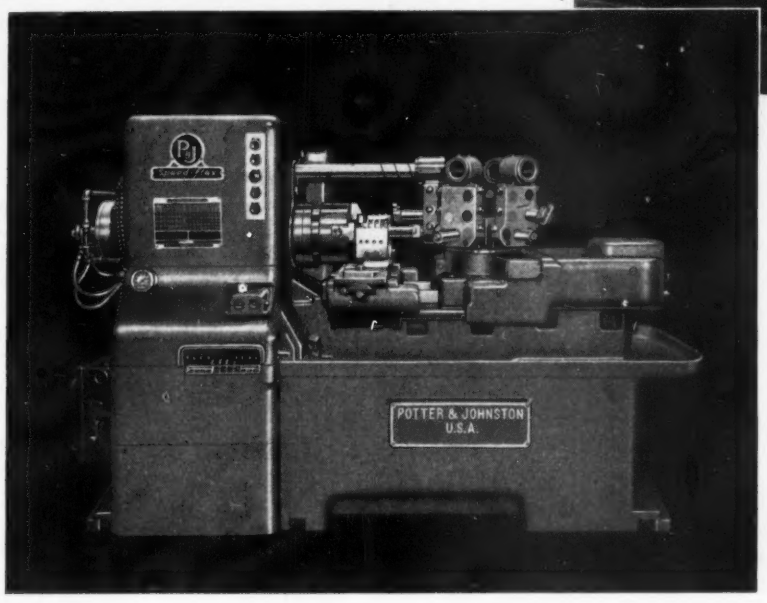
In wrought iron, there is a mixture of high pure iron and a slag of iron oxides and silicates. These materials are rather uniformly distributed and in the rolling process are stretched out into so-called threads or fibers. In general, wrought iron requires more heat in welding than ordinary steel because of its higher melting point. A somewhat larger welding tip or nozzle may be used. The welding operator becomes familiar with the appearance of the weld as it is being welded so that he can tell when and how fast to proceed. With wrought iron there should be as little agitation or pud-

(*Please turn to Page* 144)



THE PART... *cast aluminum oil seal cover with eccentric hole at center and flange holes at edge*





THE METHOD... *pieces are chucked concentrically in fast-running P & J spindle, eccentric and flange holes being drilled and reamed by ingenious drill heads driven from the spindle and held in exact relation to the work.*

THE MACHINE.....

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3-U SPEED-FLEX

AUTOMATIC TURRET LATHE

Here is a typical story of successful Potter & Johnston tool engineering based on our years of experience in solving a tremendous variety of customers' problems. Faced with the tough one of machining, *without secondary operations*, the aluminum oil seal cover shown above, P & J engineers recently worked out a method in the new 3-U Speed-Flex which does this job — *without rehandling*—in 1.8 minutes including chucking time.

Two special drill heads (center and right in photo at top) are the main features of this setup. When the turret brings these heads into operating position, a drive rod connects them with the spindle, whereupon they revolve in step with the work piece. This in turn revolves their four cutting tools through compact planetary gearing. All the "off-center" holes thereby are drilled and reamed to exact specifications. Concentric operations, of course, are handled with equal facility at other turret positions, at speeds as high as 1445 R.P.M.

We present this example of P & J special tooling not because it necessarily suits any job which you have, but rather because it demonstrates P & J ability to create tooling which will handle your tough jobs on the new 3-U Speed-Flex with unrivaled speed, accuracy and efficiency.

POTTER & JOHNSTON MACHINE CO., PAWTUCKET, R.I.

Engineering News *at a Glance*

USE OXYGEN JETS: John Miles and Partners Inc., London, which purchased patents and other operating rights of the British branch of H. A. Brassert Co., is reported to be doing extensive experimental work with the use of oxygen in blast furnaces, and to a lesser extent in open hearths. The same source revealed that foreign steel producers are using high speed jets, in place of the oxygen lance, more generally used in this country.

HANDLING SPEEDS FORGING: Through a 2-crane method of handling forgings, the Germans, during the war, could forge a 2-ton 8.8 centimeter gun barrel in 17 minutes in one heat. According to a report made to the Office of Technical Services, Washington, the cranes were electrically controlled from the main press control platform. They were fitted with special "turning-gear" type chains to narrow them, greatly facilitating forging of shorter ingots. Multiple V-block bottom forging tools used in conjunction with transverse movement of the floor table resulted in fast forging.

"FAILS SAFE": Many safety features are incorporated in the new Alco-GE 1500-horsepower diesel-electric road-switching locomotives, more than 100 of which already are operating or are on order for American railroads, it was learned from General Electric Co., Schenectady, N. Y. For example, overspeed protection is provided by a trip switch which cuts off fuel supply automatically when the engine overspeeds. If engine lubrication oil pressure drops to the danger level, a short-circuiting switch drops the engine speed to idle. Similar switches, functioning with the same end-result, operate on occurrence of a ground in the main power circuit. System is designed so in case of any trouble it "fails safe."

OPENS NEW FIELDS: Discovery through research of a new organic chemical material, referred to as beta-propiolactone, by B. F. Goodrich Co., Akron, O., is said to make possible for the first time in chemical history the commercial production of a whole series of organic chemicals previously regarded as laboratory curiosities. In addition, it is said to open up new and cheaper reaction methods of producing many basic materials already used in both chemical and plastics industries. Material is expected to better and lower costs of thermo-setting resin products, which can be made tougher and less brittle; of paint products, rubber compounding chemicals and solvents. At present the material is being made on a small scale at Goodrich's experimental unit in Avon Lake, O.

JIG JUGGLER: Huge conveyor system devised by Briggs production engineers for building steel passenger car bodies at the Briggs Mack avenue plant, Detroit, travels between two floors and transports 14 body framing jigs simultaneously past workers and subassembly conveyors. In one complete circuit of the conveyor system, dubbed "Big Bertha" an entire auto body is built from the starting point where the underbody or steel floor pan is fitted onto an empty fixture to the position where the body, completely built and welded, is removed.

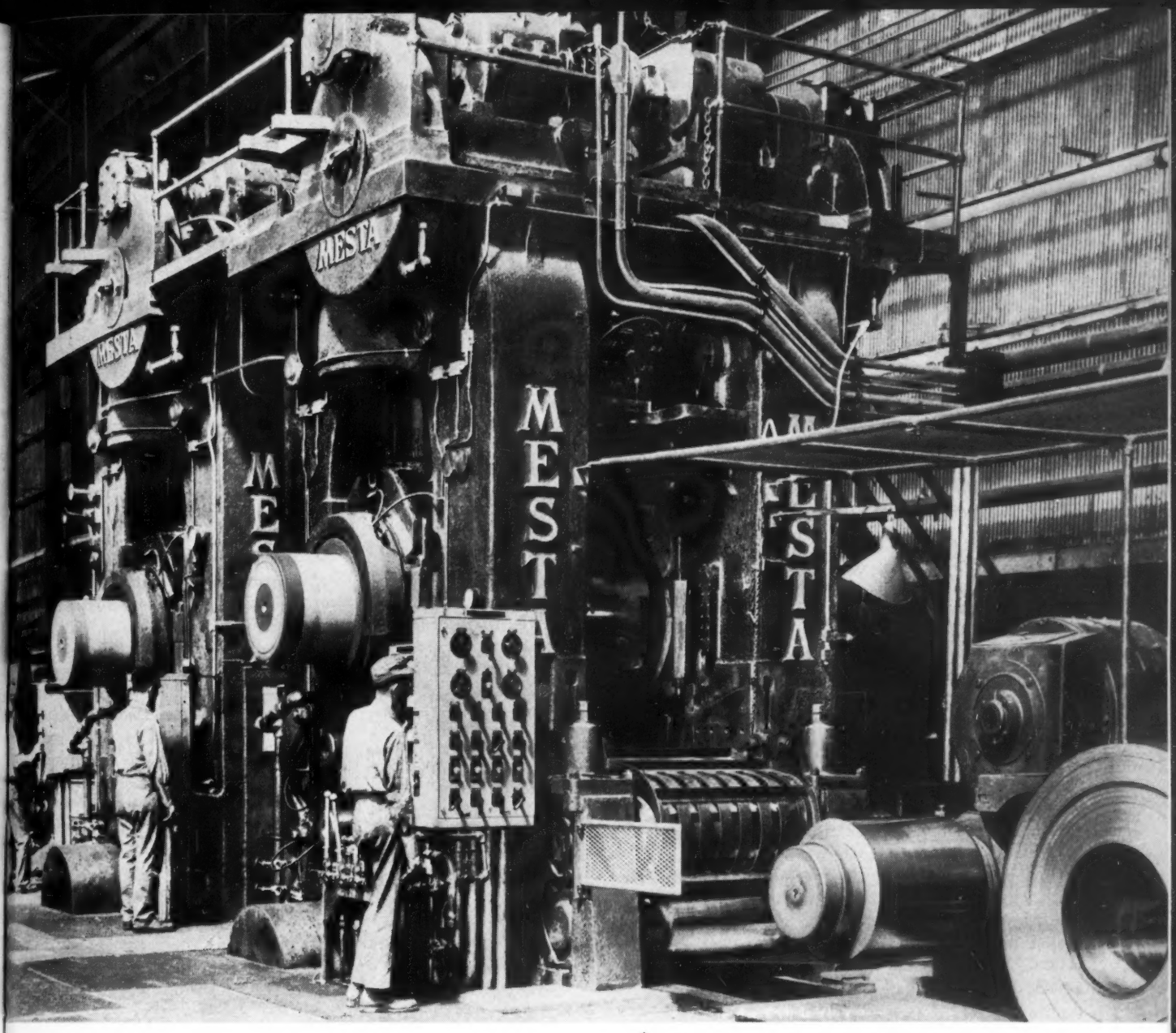
HANDLING SHOW: Almost 200,000 square feet of exhibit space, nearly three times that of the first exposition, will be occupied by the National Materials Handling Exposition in Cleveland's Public Auditorium during the third week of January. Advance reports reveal that over 150 exhibitors, some 60 per cent more than were present at the first show, already committed themselves for space. According to Edwin J. Heimer, president, Barrett-Cravens Co., Chicago, and chairman of the exposition, the 1948 show will run 5 days.

U. S. BEST ORE CUSTOMER: United States is now Sweden's No. 1 iron ore customer, according to Ulf Notini, Swedish steel executive, now in Pittsburgh to study new steelmaking practices. Chief reason is the war-time destruction of Germany's steel industry which, until Hitler's defeat, purchased nearly half of Sweden's 15,000,000 tons of ore. Another is the search by U. S. mills for high-grade ore. According to Mr. Notini, shipping costs to this country are offset by the need for less coal and coke to refine the high-quality Swedish material. His country has a reserve of around two billion tons of ore, he estimated, but Sweden has no intention of stepping up mining capacity, preferring to conserve reserves for generations. Incidentally, amount of iron ore purchased from Sweden is but a fraction of the more than 88,000,000 tons produced annually here.

"STAMPED" TRACTOR: Fabricated largely of simple stampings, a small half-track tractor currently being turned out by Super-Trac Inc., Chicago, is designed to perform any operation ordinarily done by large farm tractors. Design of the unit, expected to retail for less than $500, is such that tooling can be as simple or as elaborate as required in preliminary operations. Plates may be sheared or stamped as can many minor parts; major operating parts are fabricated on automatic screw machines. One gallon of the cheapest grade of gasoline, according to the company, enables the 6-horsepower tractor engine to operate about 4 hours.

FILM STRENGTH: An important quality to look for in a drawing lubricant is its cohesion and adhesion. A good lubricant must be able to hold together under severe pressures and high temperatures and, of course, it must be able to adhere to the metal. In short, according to Oakite Products Inc., New York, it must have film strength. Film strength which is dependent largely on the quality of basic ingredients, assures uniform and complete coverage of the work so all surfaces are protected against friction while the metal is being drawn. Good cohesion and adhesion permit more pressings with fewer paintings of the die.

"HOT HAWKSHAW": Actual ware temperature is recorded automatically to enable an operator to set furnace control instruments accordingly by a thermal ferret developed by Ferro Enamel Corp., Cleveland. Dubbed "hot hawkshaw", the electronic instrument determines exact temperature of the ware in the furnace and at various levels, differences in temperature of light and heavy gage ware, and of furnace loadings and burner adjustments. In operation, the unit is hung on the conveyor chain and run through the furnace while operating at normal load. Three 20-foot thermocouples are placed on the ware so tip of each thermocouple is touching the ware at the point where temperatures are to be recorded. The ferret then records the temperature every 3 seconds throughout the entire length of the furnace.



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TECHNICAL PAPERS

. . . presented at National Metal Congress sessions of American Institute of Mining and Metallurgical Engineers

AT the fall meetings of the Iron and Steel and Institute of Metals Divisions, American Institute of Mining and Metallurgical Engineers, Chicago, Oct. 20 to 22, the following papers, digested here, were presented:

Effect of Tensile and Compressive Stresses on the Corrosion of an Aluminum Alloy: By W. D. Robertson, Massachusetts Institute of Technology, Cambridge, Mass.—The effect of an applied tensile stress and a corresponding compressive stress on the general and intergranular corrosion of an aluminum alloy (24-S) was investigated with the following results:

Type of corrosion, general or intergranular, independent of the existence or the nature of the applied stress. It depends only on the metallurgical condition with respect to the development of preferential corrosion paths by nonuniform precipitation.

Factors Involved in Heat-treating a Magnesium Alloy: By A. E. Flanigan, I. I. Cornet, R. Hultgren, J. T. Lapsley, and J. E. Dorn, University of California, Berkeley, Calif.—Solution temperatures from 770-775° F are found most suitable for treatment of tensile specimens.

Lower temperatures necessitate longer times for homogenization. Higher temperatures require longer times for homogenization and result in inferior properties.

Thin Oxide Films on Tungsten: By E. A. Gulbransen and W. S. Wysong, Westinghouse Electric Corp., East Pittsburgh, Pa.—Vacuum microbalance measurements are made on the oxidation of tungsten from room temperature to 550° C. The effect of surface preparation surface area and pressure on the oxidation rate is also studied.

The high temperature vacuum behavior of the tungsten oxides is studied over the temperature range of 600 to 1025° C.

Vacuum Process for Preparation of Lithium Metal from Spodumene: By R. A. Stauffer, National Research Corp., Cambridge, Mass. — Experiments were carried out to determine the conditions under which lithium oxide in spodumene may be replaced by lime. Results indicate that between seven and eight moles of lime react per mole of spodumene in replacing lithium. It was found that a substantial excess of lime is required for a high yield of lithium oxide and that the reaction will take place at temperatures as low as 1000° C.

Grain Growth in High-purity Aluminum and in an Aluminum-magnesium Alloy: By Paul A. Beck, Joseph C. Kremer, L. J. Demer and M. L. Holzworth, University of Notre Dame, South Bend, Ind.—Isothermal grain growth was investigated in rolled strips of high purity aluminum and of a high purity aluminum +2.1 per cent magnesium alloy at a series of temperatures. Regardless of temperature, alloy content and amount of prior deformation, the average grain size ceased to increase further after reaching a value approximately equal to, or slightly larger than, the strip thickness.

When grain growth was not limited by the specimen thickness, the average grain diameter increased approximately proportionally to a fractional power of the annealing time. Effect of 2.1 per cent magnesium in solid solution was to decrease the grain size, as recrystallized, and to increase the fractional exponent, which determines the rate of grain growth and its decay.

Effect of Mechanical Deformation on Grain Growth in Alpha Brass: By J. E. Burke and Y. G. Shiau, University of Chicago, Chicago—Although grain growth and boundary migration are inhibited at the surface, the appearance of recrystallization nuclei at the surface is not similarly inhibited. The grain shape resulting from strain-induced growth is markedly different from that resulting from normal growth in brass, although the rate of growth is not appreciably different. This indicates that normal growth in brass is not primarily caused by differences in lattice energy.

Growth of the pre-existing grains in a deformed metal, and the formation of recrystallization nuclei are competitive processes.

Comparative Properties of Several Types of Commercial Coppers, as Cold Worked and as Recrystallized: By L. R. Jackson, A. M. Hall, and A. D. Schwope, Battelle Memorial Institute, Columbus, O.—Results of cold drawing and annealing tests on three types of copper commercially made and processed indicate: Within the range of discrimination provided by the tensile test, the shape of the true stress-strain curves for the three types of copper is practically the same despite some differences in grain size.

By using a simplified expression to describe the process of recrystallization in cold-worked copper, it was shown that softening at relatively low temperatures for long times can be predicted reasonably well from short-time higher temperature tests.

Austenite Transformation Above and Within the Martensite Range: By Robert T. Howard Jr. and Morris Cohen, Massachusetts Institute of Technology, Cambridge, Mass.—The transformation of austenite into martensite and bainite was studied quantitatively by lineal analysis in a series of five high carbon and nickel steels. Rate of martensite formation with respect to dropping temperature was determined, and a single empirical equation fitted to the five curves. Increasing carbon or nickel lowers M_s and increases the amount of austenite retained at room temperature.

Increasing the quenching rate, while not affecting M_s increases the rate of martensite formation with respect to dropping temperature, and

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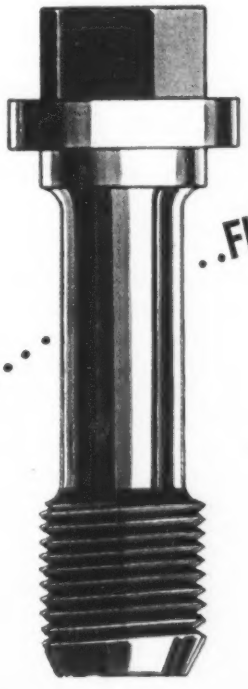

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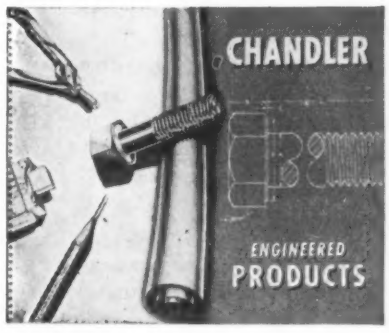

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therefore decreases the amount of austenite retained at room temperature.

Isothermal Transformation of a Eutectoid Aluminum Bronze: By David J. Mack, University of Wisconsin, Madison, Wis.—It has been shown that the martensite formed from either the β or β_1 will, at an appropriate temperature, transform to pearlite. It was found that the disorder-order transformation in the B solid solution (from β to β_1) will not occur below 93° C.

The 1 per cent chromic acid electrolytic etch suggested by Coons and Blickwede was found to be ideal for revealing the structures developed in the isothermally transformed aluminum bronzes.

Some Observations of Lineage in Copper Crystals: By Walter R. Hibbard Jr., Yale University, New Haven, Conn.—Investigation includes metallographic, x-ray and property studies of lineage in large grain and single crystal specimens of copper.

Structure, Segregation and Solidification of Semikilled Steel Ingots: By Michael Tenebaum, Inland Steel Co., East Chicago, Ind.—This paper reports the results of an investigation of the structure and segregating characteristics of a series of experimental semikilled steel ingots. The experimental ingots were made with intentionally varied deoxidation under ordinary basic open hearth operating conditions.

By regulating the manner and extent of ladle and mold deoxidation, ingots were produced whose tendency toward gas formation ranged from a weak rimming action to a completely dead appearance. The obvious features of semikilled ingot structure, such as pipe and subsurface blowholes, were primarily affected by the manner and extent of ladle and mold deoxidation.

In mold deoxidation, timing of the addition was as important as its amount. Feeding aluminum throughout the pour affected ingot structure much in the same manner as ladle deoxidation, an increase in the amount of the addition reducing the tendency toward gas formation.

Tantalum Powder by Magnesium Reduction: By J. Prieto Isaza, Institute de Foments Industrial, Bogota, Colombia, A. J. Shaler and John Wulff, Massachusetts Institute of Technology, Cambridge, Mass.—A simple method for making metallic powders from volatile compounds of refractory metals has been successfully applied to tantalum and columbium.

In applications not requiring a complete separation of columbium and tantalum it is possible to carry out the manufacture of metal powder directly from the ore concentrates in a very few operations; namely, mixing of concentrate and carbon, chloridization, mixing chlorides and magnesium, reduction, leaching and drying.

Plating Molybdenum, Tungsten, and Chromium by Thermal Decomposition of Their Carbonyls: By J. J. Lander, and L. H. Germer, Bell Telephone Laboratories, Murray Hill, N. J.—Molybdenum and tungsten have desirable corrosion and temperature resistant properties, but the metals in bulk are expensive and their fabrication is difficult. Such considerations led to a search for a method of plating them upon base metals. This search was successful and led furthermore to a number of developments which could not have been foreseen.

Thin Oxide Films on Molybdenum: By E. A. Gulbransen and W. S. Wysong, Westinghouse Electric Corp., East Pittsburgh, Pa.—Vacuum microbalance measurements are made on the oxidation of molybdenum from 250° C to 450° C. Effect of pressure, surface preparation, concentration of inert gas in the lattice, cycling procedures in temperature and vacuum effect are also studied.

Oxidation follows the parabolic law from 250° C to 450° C. Deviations start to occur at 450° C.

Passivity in Chromium-iron Alloys; Adsorbed Iron Films on Chromium: By Herbert H. Uhlig, Massachusetts Institute of Technology, Cambridge, Mass.—Iron brought into contact with chromium is passive at the interface. This was demonstrated by electroplating or evaporating iron on a chromium surface and immersing in 3 N HNO_3.

A residual film of iron always remained on the chromium surface. The amount of residual iron resistant to nitric acid was determined by treating the chromium surface with 1.5 N HCl and analyzing for dissolved iron using the spectrophotometer.

Purification of Aluminum and Its Alloys: By Yves Dardel, Centre de Documentation Siderurgique, Paris, France—Various methods of cleaning aluminum and its alloys are discussed in this paper.

Preferred Orientations in Drawn and Annealed 70-30 Alpha Brass Tubes: By Walter R. Hibbard, Jr., Yale University, New Haven, Conn.—Preferred orientations in drawn 70-30 alpha brass tubing were rationalized on the basis of a double texture with the (111) pole and the (100) pole parallel to the drawing direction and a random orientation about these directions as an axis. This texture is similar to the fiber found in drawn alpha brass wire.

Behavior of Metal Cavity Liners in Shaped Explosive Charges: By George B. Clark and Walter H. Bruckner, University of Illinois, Urbana, Ill. In this paper the authors offer a theory based on the microstructure of a collapsed cast iron cone to explain some of the physical laws involved in jet formation.

Study of the microstructure of a collapsed cavity liner shows that cast iron is ductile under conditions of temperature and pressure involved and indicates that jets from cast iron liners are composed of a fine spray of graphite, partially spheroidized pearlite and ferrite. Collapse of cast iron conical liners appears to involve processes of compression, shear, and extrusion of particles from the inside of the liner.

Jet formation from cones also involves flow of metal subject to intense pressures and temperatures that are below the melting point of the metal. Metal appears to obey the laws of hydraulic flow.

Quenching of 75S Aluminum Alloy: By W. L. Fink and L. A. Willey, Aluminum Co. of America, New Kensington, Pa. It has been found that sufficiently slow quenching impairs strength and resistance to corrosion of the alloy 75S. Range of temperature through which tensile properties are most adversely affected by a slow quench is from 750 to 550° F.

When the average quenching rate through that range exceeds 800°F per second, maximum strengths and resistance to corrosion are obtained. When the average quenching rate over the critical range lies between 800°F per second and 200°F per second, the strengths are impaired slightly, but resistance to corrosion is substantially unaffected. At rates down to 35°F per second, the strengths decrease more rapidly and resistance to corrosion decreases to a minimum. At still lower rates the strengths decrease very rapidly, but resistance to corrosion improves.

Testing Gun Steel and Other Alloys

(*Please turn to Page* 141)

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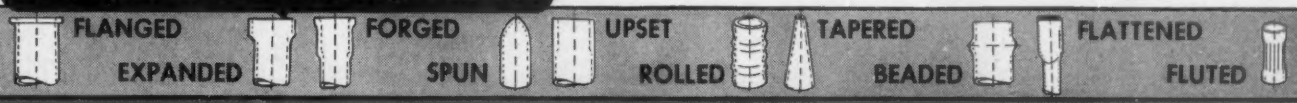

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Achieves Smoother Materials Flow

IN the tinplate department of the Jones & Laughlin Steel Corp., Aliquippa, Pa., an electric-truck materials handling system is used which illustrates the important principle of fitting the style and capacity of each truck to its particular job, rather than arbitrarily buying all the trucks in the fleet of a size and style suitable for the heaviest loads, and using them interchangeably.

Thus, Jones & Laughlin can achieve top efficiency from each truck in its fleet and save a considerable amount in both initial purchase price and maintenance of the equipment. In addition, by using the right truck for the job Jones & Laughlin's shippers at Aliquippa can perform mechanical handling functions not otherwise possible.

The fleet used in the sorting room, and warehouse and at the railroad siding, comprise two large center-controlled trucks of 8000 pound lifting capacity, Fig. 3; three high-tiering end-controlled units of 6000 pound capacity; two cable-tilting end-controlled trucks of 5000 pound capacity, Fig. 1; and one of the new tilting-fork Worksaver models, Fig. 2. All are made by Yale & Towne and electrically powered.

Since the tinplate department at Jones & Laughlin loads 35 freight cars per 8-hour day, plant layout is an important factor. The railroad siding runs between the sorting room and the warehouse and is bridged by cable-lifted drawbridges of the type shown in the foreground of Fig. 1.

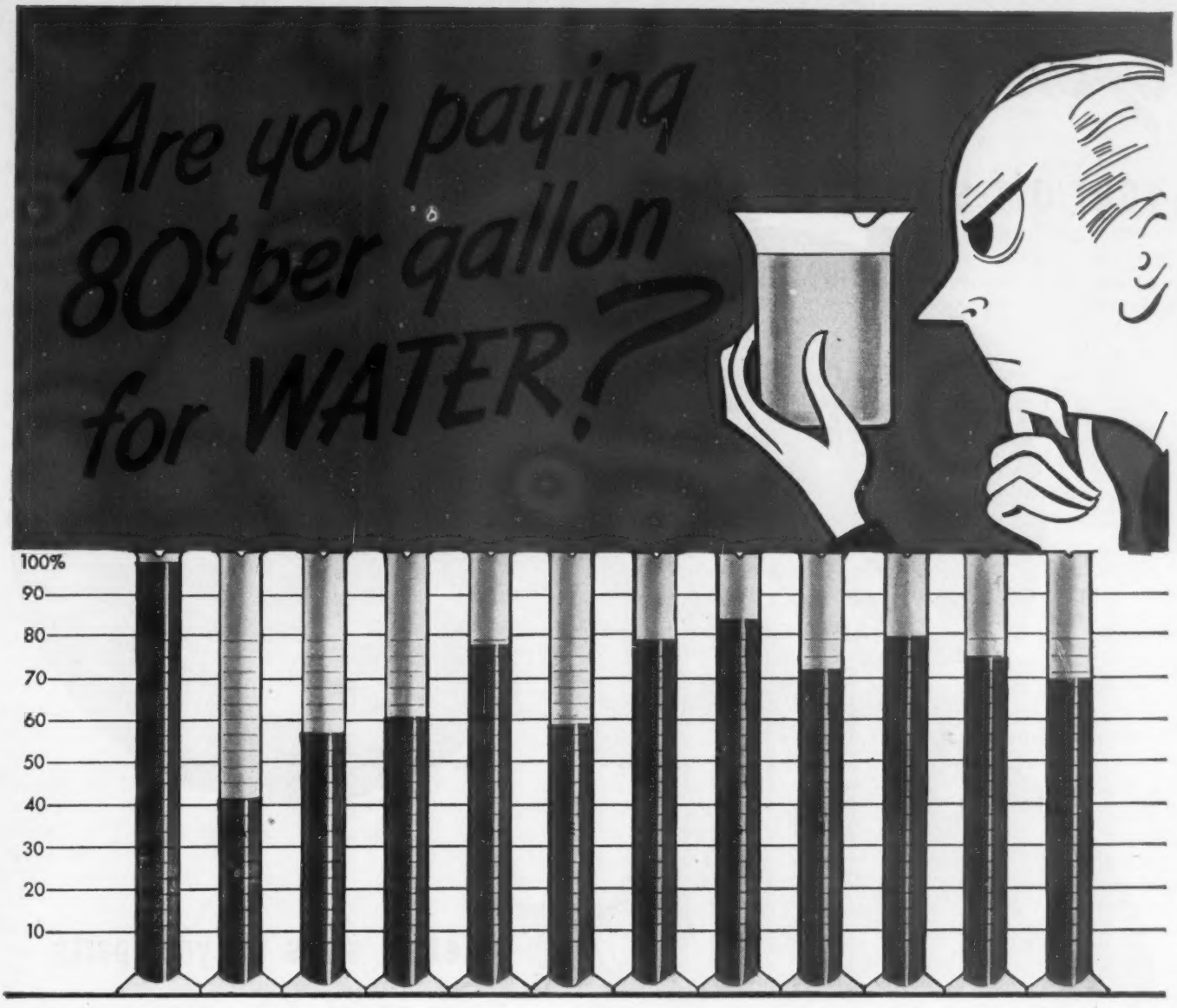
Heaviest trucks of 8000 pound rated capacity (five times that in draw bar pull), are used for the longest hauls and heaviest loads. Each of the platform-strapped bundles shown in Fig. 3 weigh between 2200 and 3000 pounds so that the truck shown is carrying between 3½ and 4½-tons on its forks and hauling between 10 and 14 tons, exclusive of the weight of truck or trailer. The trailer is of the 4-wheel steer variety, with diagonal wheels coupled so that the rear wheels follow in the exact track of the front wheels when turning.

High-stacking operation is carried on with a 6000 pound truck stacking eight-high with 3 tons in the air—each 8-high stack totaling 12 tons. The load is electrolytic tinplate, 112 sheets to a package, 10 to 15 packages to a platform. End-controlled trucks are preferred for this operation because of the ease with which the operator can step off the

Fig. 1—Cable-tilting end control type of truck with 4-wheel steering, used by J & L for freight car loading, where its extreme tilt and short turning radius are advantageous

Fig. 2—Worksaver truck, also used by J & L to load freight cars, leaves only 6 feet of center-way between end loadings instead of previous 10 feet. Car load is increased to 62 from 50 tons

Fig. 3—Center-controlled electric truck of 8000 pounds capacity carrying between 3½ and 4½-tons on its forks and pulling between 10 and 14 tons, exclusive of truck and trailer weight



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Now let's assume you've just bought 100 pounds of this "average" cleaner at 10¢ per pound. You've *really* bought only 74 pounds of *cleaner* . . . the remaining 26 pounds are just plain water! At 10¢ per pound, the cost of that water comes to more than 80¢ per gallon!

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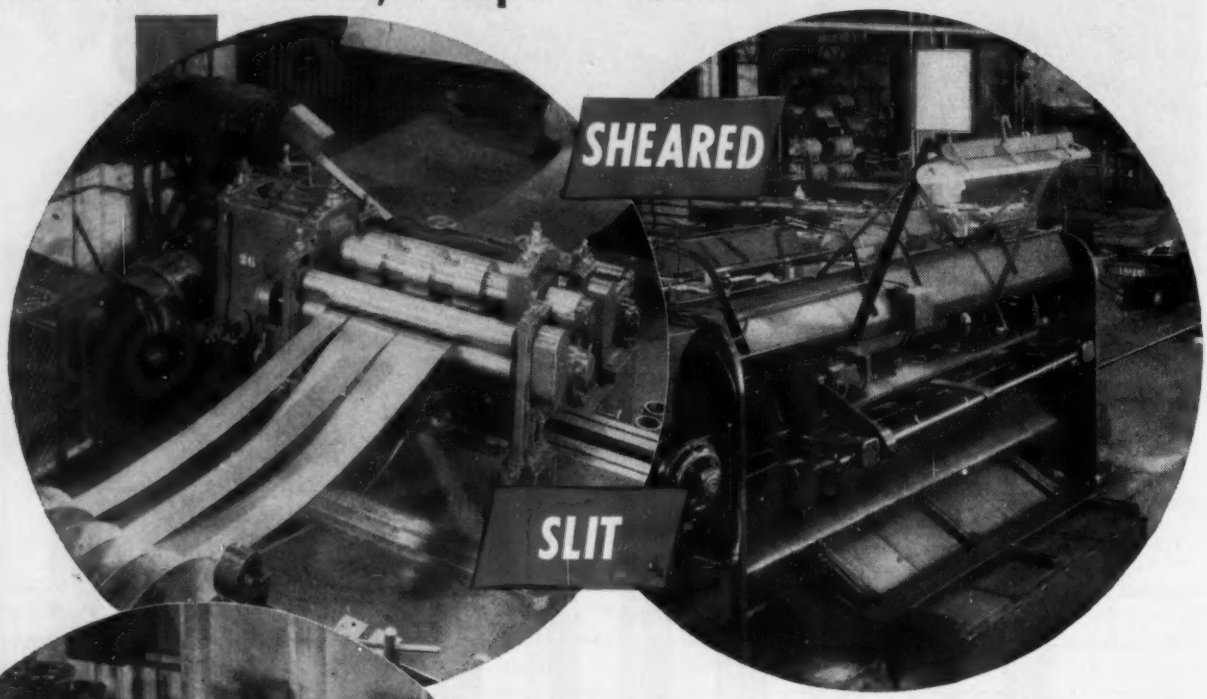

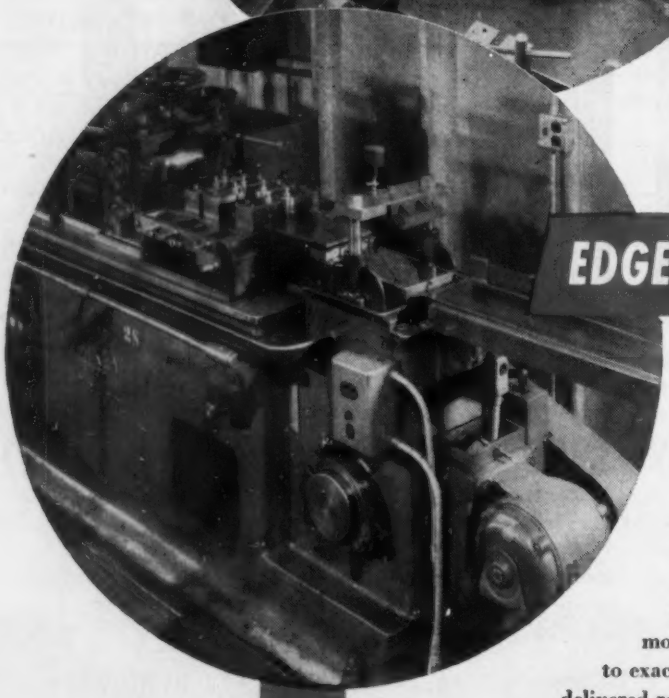

to exact sizes for your parts

With the continuing difficulty of obtaining steel in today's market, many manufacturers are forced to buy their steel "catch as catch can". Frequently this steel is the right gauge but sizes are impractical for working on existing equipment. Sheets are too large . . . strips are too wide . . . coils are too heavy . . . straight lengths are needed instead of coils. This is where General Steel Warehouse service plays its most important part.

Many fabricators when buying off-size sheets and strip have the steel delivered directly to Gensco. Here, with the most modern equipment, it is—sheared—slit—edged—cut to length—to exact specifications, packaged to meet handling requirements and delivered ready for efficient production requirements.

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rear platform, and the better perspective the operator can get of the stack he is building.

For freight car loading the extreme tilt of the cable-tilting end-control type of truck, and its 4-wheel steer for short turning purposes, are preferred, as shown in Fig. 1. Within the car such maneuverability is important. Cable-tilting trucks are now obsoleted by hydraulic or rack-and-gear tilting, but Jones & Laughlin has used them for many years.

Latest Addition Has Low Weight

The tilting-fork Worksaver is the latest addition to the J & L fleet. It has found many jobs associated with its low weight, ability to be hand-guided rather than ridden, its lower cost, and its maneuverability. Because of its "in-between" function—maneuvered like a hand truck but fully powered by electricity for both lift, tilt and transport—it can eliminate manual effort in places where full-scale truck power is either impossible to use or wasteful.

In Fig. 2, the new truck is shown loading box cars, which it can do so as to leave only 6 feet rather than 10 feet of center-way between the loadings on either side of the door. Thus it is possible to load 62 tons rather than 50 tons. The mast of the unit shown has even been cut down to 68 inches so that the truck can enter the lowest closed trailer of a highway truck—its weight (2500 pounds plus battery) being low enough to allow it to run right over a truck tail gate and in where the tight fitting of the loads is taking place.

Lifting function of the Worksaver also helps greatly in the "piece block" bay of the J. & L tinplate sorting room where partially loaded platforms are shuffled back and forth from bench line to floor line in making up assortments for special orders. The unit shown will lift 2000 pounds with a 48-inch load length and 3000 pounds with a 28-inch load length. It has two speeds forward and two speeds in reverse.

Another of its functions is placing platforms of tinplate on weighing scales at any height, and delivering them to and taking them from the inspection tables.

Modern materials handling equipment is today available with so many special features and in so many styles and varieties that an almost perfect fit of equipment to function can be achieved. Jones & Laughlin found it wise to consider the use of different types of equipment for different types of jobs. It has found that the larger power and cost of the big equipment is not wasted on the smaller jobs, the greatest possible number of handling functions can be mechanized, and the truck used on each job can be appropriate both for the loading, the dictates of safety, the length of movement, and the maneuvering and manipulating extremes involved.

Sponge Iron Substituted For Scrap In Making Steel

Sponge iron, substituted for scrap, has been used successfully in the production of a high quality steel suitable for the manufacture of tool and cutlery instruments, according to a publication summarizing Bureau of Mines reseach in this metallurgical field. In an emergency, the sponge iron could be put into production almost immediately, using available equipment, such as brick plants or cement kilns, the report states.

Experimental work in sponge iron —a porous product resulting from the reduction of an iron oxide at a temperature so low that fusion does not occur—was started by the bureau in 1942. Producing the iron from gaseous and solid fuels was investigated. It was found that iron ore deposits too small to warrant construction of an expensive blast furnace or not near enough to coking coals to be economically usable could be processed into sponge iron at small brick plants. It could produce without using coking coals and on a smaller scale than was economical in blast furnaces.

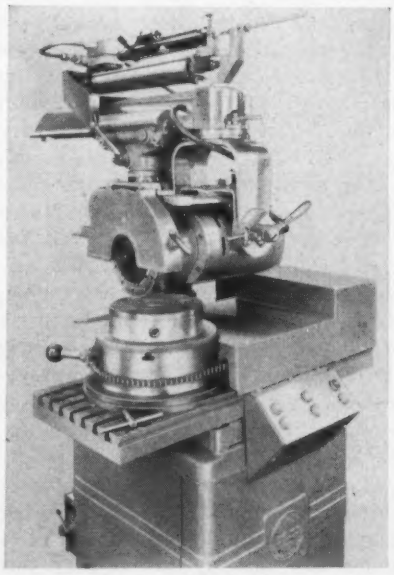
Unusually effective in producing tool steels in basic electric furnaces, the report said, sponge iron, when used with scrap containing contaminating elements such as lead, copper, tin and zinc, improved the quality due to the fact that it contains little or none of them.

Machine Conversion...

quadruples production operations on powdered metal parts

GROOVING operations on powdered metal aircraft parts are being performed four times faster in the Cleveland plant of S. K. Wellman Co. since the conversion of a standard radial cut-off machine to an automatic grooving unit. The production rate is reported to be three pieces per minute, the work consisting of machining eight radial grooves on each side of a disk.

To meet its requirements, the company equipped the cut-off machine, made by Walker-Turner Co. Inc. of Plainfield, N. J., with a diamond-impregnated metal wheel and a magnetic chuck mounted on an automatic index table. The sliding head was motivated by an air cylinder with provision for metering the feed.



The head moves out and cuts a groove 1/8-inch wide and 0.010-inch deep in the powder metal disk and then automatically returns to its initial position. Through an electronic sequence control, mounted in the base of the machine, the index table then moves the work to the next position and the cycle repeats itself.

According to Wellman, extremely accurate work can be done with this machine setup. Depth of each groove is held within 0.003-inch and the accuracy of index with 0.005-inch. The machine uses a 10-inch diameter wheel which travels at 3000 revolutions per minute with a feed of 120 inches per minute. The powdered metal disk is bonded to each side of a steel core having an internal spline. It measures 5 inches outside diameter, 3 inches inside diameter and 1/16-inch thick.

Cathodic Corrosion

(*Concluded from Page* 106)

selected, field-tested and proved satisfactory. Since that time several hundred installations have been made for protection of pipe lines, cable, storage tanks, sheet piling, lead sheath cable, steel poles and tower footings.

These installations proved magnesium's excellent qualifications for use as a galvanic anode. If only 50 per cent of the theoretic capacity of magnesium were to be realized in practice, the energy storage would still be large considering the high potential, for the storage of electricity in magnesium theoretically amounts to 1000 ampere-hours per pound as compared with the 100-120 ampere-hour capacity of the ordinary automobile storage battery.

Since the first new anodes were installed, progress has not rested on its oars. The metals protection laboratory workers were irked by the comparatively fussy methods of installing the anodes for ground use. A hole was drilled near the structure requiring corrosion protection, the lead wire fixed and a chemical mud composed of gypsum and bentonite poured into the hole to form a backfill to help the anode deliver more current, operate more efficiently and corrode more uniformly.

Complete Package in Cloth Bag

"Why not a complete mud and anode package?" they asked. The answer was a cloth bag containing the chemical required for the mud, the anode and the lead wire, the latter extending through an opening in the top of the bag.

More than a year ago a field testing program was begun on the packaged anode. From 300 to 400 anodes were installed, some in the conventional manner, others in the packaged forms, under a variety of installation conditions.

Question metals protection men asked was, "Is the current output from a packaged anode as good as that from an anode installed in the conventional manner?"

Their research furnished the answer, a decided notation of "equivalent performance, simpler installation" in favor of the packaged anode. This package, now sold under the trade name "Galvopak", is simply placed in the ground opening, the wire connected to the cathode, and water poured over the anode to give the chemicals the moisture needed to form the chemical mud.

But underground corrosion from moisture is not the only type in which cathodic protection principles are effective. It can be invaluable in sea water where boat hulls, ballast compartments on sea-going tankers, piling, harbor installations of all types, piers and sheet piling are constantly requiring replacement.

In addition to laboratory tests an experimental program is being carried on at Kure Beach, N. C., to discover which magnesium composition works best in sea water, to determine corrosion rates, and the current density required to stop corrosion on steel in sea water.

Initial High Current Reduced

Experimental work at the North Carolina site showed that an initially excessive current followed by a current reduced to a much lower value than is ordinarily applied, makes the most efficient protection. For example, 15 milliamperes of current per square foot applied to the cathode is not adequate to effect protection until from 3 to 6 months or more have elapsed. But given an initial current of 50 milliamperes per square foot for 5 days, the current may be reduced to 2½ to 3 milliamperes and still provide effective protection for an indefinite period of time. Reason for this seeming incongruity is that the high current density initially applied lays down a calcareous coating on the steel which has the effect of drastically reducing the permanent current requirement.

Anodes from ground and water field tests being run in various parts of the country are returned periodically to the Midland laboratory for examination. Here they are cleaned, weighed to determine how much magnesium has been expended, the current delivered from each anode during its installation period recorded and current efficiency determined. They are especially examined for uniformity of corrosion at the Metals Protection Laboratory too.

Still another application being investigated for magnesium anodes is their use in cathodic protection for fresh water installations. Experiments are scheduled to ascertain how much current must be applied to effect protection and how many anodes are needed to supply the current required. Current requirements vary considerably with composition of water involved.

Elevated water storage tank protection is being tested for magnesium anode application. Several companies are already attempting this control with electrolytic anodes which are a highly effective means for cathodic protection, but do pose a considerable maintenance problem inasmuch as they require an external source of power and their fuses may blow unexpectedly due to inadvertant shorting of circuits.

Magnesium anodes, wherever they are applicable, are expected to produce cheaper installation and greater ease of maintenance in protecting both the bowl of the tank and the riser pipe. Part of the elevated tank problem includes research on engineering design, to develop magnesium installations for various shapes and sizes of tanks exposed to water of varying compositions.

According to Dow engineers, it is ultimately expected that magnesium will be used to protect a wide variety of structures ranging from domestic and commercial water softening units to fire water storage tanks. Use of magnesium anodes in the domestic hot water tank is proving outstanding in tests. The extruded anode took shape as a small-diameter rod of magnesium with a core of steel wire to prevent premature segregation of the magnesium at points where concentrated attack might take place.

Experimental program for testing anodes for home heaters includes operating various type tanks in pairs, one tank serving as a control and the other equipped with an anode. In a matter of a few months, the "mildly aggressive" Midland water was downed in battle and corrosion protection with that type of water was brought about.

Field tests are now under way in Hartford, Conn., Scranton, Pa., Little Rock, Ark. and San Diego, Calif., to determine effect of magnesium under extreme range of corrosive conditions throughout the country. Further tests are being conducted on tanks containing water as it would be softened for home use and water at temperatures as high as 180° F, since new home appliances such as dishwashers, electric sinks and new laundries require hotter water. Both conditions result in a higher corrosion rate in the hot water tank.

Movie Describes Transfer Machine Operation

Operations of four individual automatic transfer processing machines built to machine 75 automobile cylinder blocks per hour at 80 per cent efficiency are described in a 16 mm black and white sound movie released by Greenley Bros. & Co., Rockford, Ill.

The 15-minute movie shows how individual machine heads operate and how the work pieces are machined in a continuous automatic cycle.

Cuts Welding Time from 11 to 7 Hours with "Fleetwelding" Technique

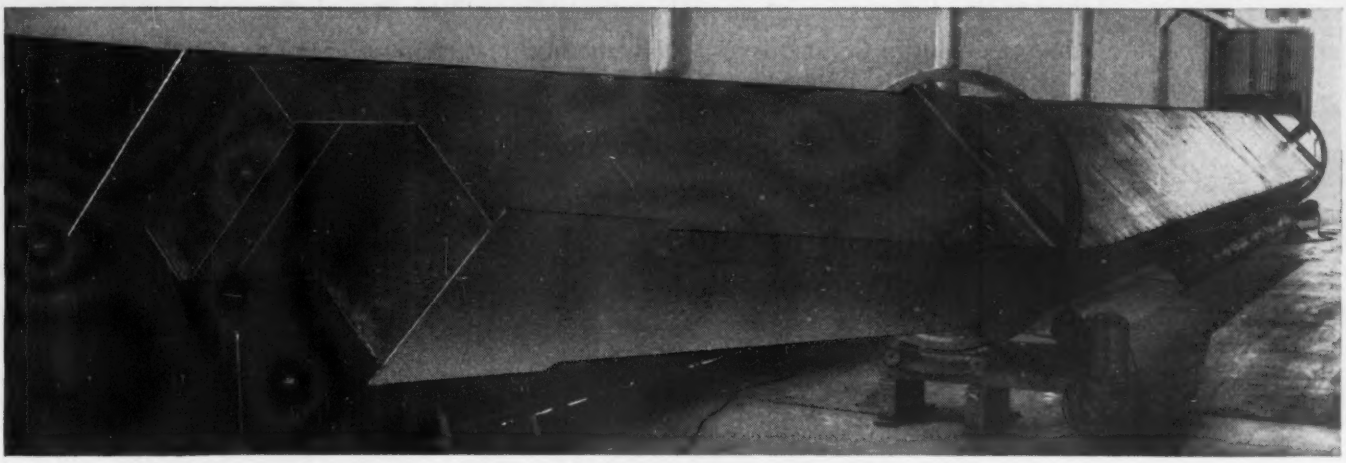


Fig. 1. The 100′ crane box section is mounted in rotating fixture which positions all finish welding for downhand.

By BOYNTON NISSEN,
Partner in Charge of Operations
Milwaukee Crane & Service Co., Milwaukee, Wis.

FIG. 1 shows a large crane box section, fabrication cost of which was recently reduced by adopting "Fleetwelding" techniques that greatly speed up the welding.

This box section is made from mild steel plate and is approximately 100′ long. The sides are 60″ wide and ⅜″ thick; bottom is 24″ wide and ½″ thick; top is 24″ wide and ⅝″ thick.

In Fig. 1 note the motor-driven positioning fixtures which are used to rotate the weldment, so as to put all welding in the downhand position. This is the first principle of "Fleetwelding".

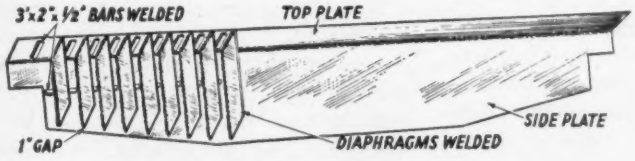


Fig. 2. Schematic view of the box section.

The ring fixtures are discarded locomotive tires which we salvaged from a scrap heap.

Fig. 2 is a sketch of the box section, showing internal diaphragms. The first step in assembly is to lay one of the side plates on a long work table and weld the diaphragms to it at approximately 3½′ intervals. Second, the top cover plate is skip-welded to the diaphragms and side plate. Bars 3′ x 2″ x ½″ are welded to sides and top to prevent buckling. Third, with assembly still on the work table, the other side plate is welded to the top plate and diaphragm. Fourth, the assembly is picked up with a hoist, turned and set on horses, and the bottom plate tacked on. There is a gap of about 1″ left between the diaphragm and the bottom plate so that any water that might accumulate inside the box section can run out of holes that are punched in the bottom plate, preventing rusting.

The last operation is insertion of the section in the rotating fixture for finish welding of all outside seams. In accordance with "Fleetwelding" principles, the electrode size for best speed and highest practical current is used. The good fit-up of the members further increases welding speed. Fig. 3 shows how the operator makes continuous welds joining web to flange, with assembly in the 45° "flat-fillet" position. ¼″ "Fleetweld 9″ electrode at 300-325 amps. is used. A total of 250′ of welding is required to join the webs to upper and lower flanges.

The adoption of these procedures has increased the welding speed from approximately 6″ per minute to 12″ per minute, and thereby decreased the total welding time from 11 to 7 hours.

Fig. 3. Making speedy "flat fillet" finish welds with "Fleetweld 9".

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Advertisement

Oxygen For Decarburization

. . . chief topic of discussion at annual southern Ohio Open Hearth Committee, AIME, meeting in Columbus, O. New method of charging open hearths and qualities of present-day scrap also covered during the session

USE of oxygen to decarburize open-hearth steel was the dominant topic of discussion at the annual meeting of the southern Ohio section of the National Open Hearth Committee of the American Institute of Mining & Metallurgical Engineers at Columbus, O., Oct. 31.

That subject, first topic on the morning program, not only occupied the bulk of the morning session but recurred in connection with other steelmaking topics in both the morning and afternoon meetings. Supplementing the discussions were slides and colored motion pictures showing data and practices in the use of oxygen for decarburization.

Among other topics discussed were new method of charging open hearths, desulphurization of fuel oil for open hearths, qualities of present-day scrap, and spectrographic control over alloy content of steel. Also on the program were colored movies of development and operations at the Steep Rock iron ore property in Ontario, Canada.

Opening the discussion of oxygen was a paper by Robert Carpenter of the Massillon, O., plant of Republic Steel Corp., who also served as co-chairman of the morning session.

While no one deprecated the use of oxygen for decarburization, those who had been experimenting with it reported it has its shortcomings. However, none regarded those shortcomings as insurmountable. In fact, all those who had been experimenting with oxygen reported that with great hopefulness they are continuing their experiments.

Principal conclusions of those experimenting with the use of oxygen are that, 1. Higher grade refractories are needed; 2. oxygen must be cheaper in price; and 3. fumes and dust must be overcome.

Biggest problem in use of oxygen, it was brought out, is the maintenance of furnaces, particularly the roofs. With the use of oxygen, roof life is reduced 50 per cent, it was reported. While some operators were of the opinion that splashing of the bath onto the roof cut the life of roof, others pointed out that roofs were burned away evenly and laid the blame on effects of iron oxide fumes resulting from the use of oxygen.

While considerable interest in oxygen was manifest, some of the operators reported they are not using it because of the costs involved. One means of helping hold down the costs, it was pointed out, is to buy oxygen by the carload rather than install expensive generating equipment. Discussion of the economics of the use of oxygen was accompanied by a comparison of the less costly practice of utilizing compressed air for decarburization. However, those who had experimented with compressed air reported the results were "not anything astounding." Splashing of roofs occurred just as extensively with the use of compressed air as with oxygen, some of the users said.

Holding back experimentation with oxygen and compressed air for decarburization of open hearth steel are fumes and dust which not only present operating problems, such as clogging of flues, but which violate anti-smoke ordinances in various municipalities. However, some of the operators reported washing equipment is helping overcome the fumes and dust problem.

If the advantages of the use of oxygen to reduce the heat time are to be preserved, the scrap must be readily available to the furnaces so charging time can be cut, it was pointed out.

Representatives of several steel companies asserted their finishing mills have had no loss attributable to steel in which oxygen had been used to speed decarburization and declared they do not hesitate to apply such steel to any use that steel produced in the conventional manner would be employed.

Speeding Up Charging: A method of speeding the charging of open hearths was discussed by John H. Kincaid of the Wellman Engineering Co., Cleveland. Pointing out that the idea of increased efficiency and speed in charging is not new, Mr. Kincaid emphasized, however, that its importance has recently come to be more appreciated, due to use of oxygen which in reducing melting and refining time by one-half has resulted in charging time being a larger proportion of the total heat time. "Whereas, the charging time formerly was only one-sixth of the heat time, it is one-third of the time with oxygen," he stated.

Adding to the problem of charging time is the increased proportion of light scrap produced in recent years, making it necessary for the charging machine to handle a larger number of boxes to charge a given tonnage than when heavier scrap was used, Mr. Kincaid said.

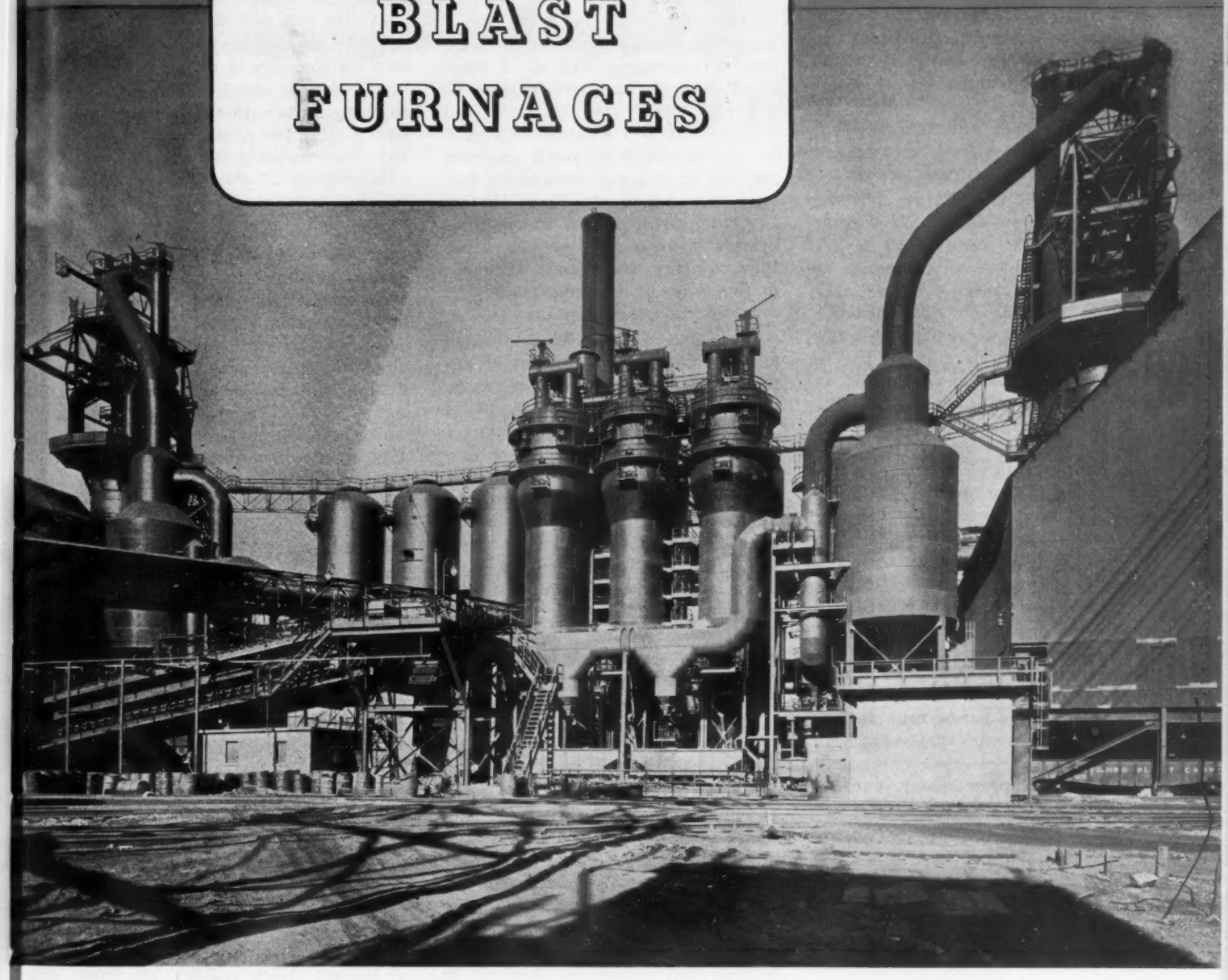
In a 150-ton open-hearth furnace using 60 per cent cold metal, 90 tons, mostly scrap has to be charged. If the box capacity is 2000 lb, 90 boxes have to be handled, and the minimum charging time would be about 50 minutes.

Method suggested by Mr. Kincaid handles the entire cold metal component in a single charge requiring only 6 minutes, a saving of 90 per cent in time over the charging box method. The process, designed especially for mass charging of light scrap although equally suitable for handling heavier grades of scrap and pig iron, he said, departs from the "spoonful" method of charging. "It is comparable with methods and machinery now used for handling practically all other products in steel works since it permits the entire cold metal charge required for a heat to be deposited in the furnace at one time. Thus it affords a more economical method as to power and fuel consumption, speed of operation and maintenance cost of the charging equipment as well as the furnace itself," Mr. Kincaid declared.

Although the method is still in the schematic stage, the objectives would be attained by constructing the open hearth with a removable front which

NUMBER 11 IN A SERIES OUTLINING McKEE SERVICES TO THE IRON AND STEEL INDUSTRY IN RECENT YEARS

BLAST FURNACES



IN the great expansion program covering the last 10 years, the Iron and Steel Industry spent many millions of dollars for the engineering and construction of new production facilities and rebuilding of existing facilities.

During this period the McKee organization, in addition to many other activities for the industry, undertook contracts on 26 blast furnaces, more than half of which were for complete plants, including stoves, cast houses, stock houses and gas cleaning equipment.

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would be substantially as long as the hearth. The front would be readily extracted and replaced to permit insertion of a charging pan. This charging pan would have a floor area similar in size to that of the open-hearth furnace. This makes it possible, Mr. Kincaid pointed out, to cover the entire hearth with cold metal or other material in one charging operation. At the same time, the furnace front is provided with hot metal, and inspection doors arranged to function in the usual manner.

"Loading of the charge onto the charging pan which is moved about the yard on a transfer car is accomplished in the same manner as with ordinary charging boxes," Mr. Kincaid explained. "After loading, the transfer car moves to the hoisting tower, which elevates the pan to the charging floor and places it on an extended cradle of the charging machine. The charging machine is then moved down the track until it is opposite the furnace to be charged.

"In charging a furnace, the front of it is removed when the charging machine is opposite the furnace. The cradle and loaded pan are then run into the furnace the full distance. Retraction is commenced immediately and, while being retracted, the pan floor is caused to roll underneath the pan frame, thus depositing the charge uniformly upon the furnace hearth. Rear wall of the pan is held stationary. After the entire charge has been deposited progressively on the hearth in a layer of approximately uniform thickness, and while the platform and cradle still are being retracted, the pan floor is rolled back onto the upper side of the pan frame. When the cycle of operations has been completed, the empty pan is transferred to the hoisting tower, lowered onto the transfer car and refilled for charging another furnace."

Mr. Kincaid said the estimated time of cycle is as follows:

	Minutes
Load cradle on charging machine at tower	1
Travel to furnace	2
Discharge stroke	¾
Return stroke	¾
Travel to tower	1½
Total	6

"The process," said Mr. Kincaid, "is entirely feasible; the furnace construction presents no difficult problems; the area of the pan is ample for the entire scrap charge, and the special charging machine requires no wider charging floor than for the usual low type charger. However, due to the large weight of the charge, the runway girders will have to be heavier than customary. The head room above the furnace will have to be sufficient to provide clearance for the doors when elevated to the open position.

"This system eliminates the use of machines equipped with a charging ram for engaging, one at a time, small charging boxes which must be inserted, turned over to dump and removed. It also eliminates expense of cutting scrap to small charging box size or to a size dictated by furnace door dimensions. Since the entire charge is deposited at one time, furnace doors are opened only once, thus reducing heat losses. Charging in this manner is accomplished with reduced power consumption

"It is evident," Mr. Kincaid pointed out, "that the system cannot be applied to existing furnaces, but can be used only in connection with a new installation designed to utilize its advantages. During the years immediately preceding the recent war no new installations were being made, only replacement of worn-out equipment. During the war years there was little time to develop new processes, but rather a great rush to build additional facilities in accordance with conventional designs. Now that economy of operation is of prime importance, consideration of new open hearth charging methods to replace the multiple charging of small quantities of scrap should receive serious consideration by the steel industry," Mr. Kincaid declared.

Desulphurized Fuel Oil: Discussing desulphurization of fuel oil used in steelmaking, H. G. Cannon, Refining Control Division, Standard Oil Co., Cleveland, suggested that the steel companies and the oil industry enter into a co-operative program to find and develop economical methods of sulphur reduction of petroleum in preparation for the day when nearly all crude petroleum that will be available will be of high sulphur content.

As oil reserves diminish, requiring oil companies to go farther afield for crude, the higher will be sulphur content of the crude available, Mr. Cannon pointed out. "Much of the oil now being obtained from Texas and also from foreign areas is of the sour type, containing 2 or 3 per cent sulphur, in contrast to around 1 per cent in sweet crude.

As long as sweet crude is available it can be blended with sour crude to attain a lower sulphur content. However, because of additional refining costs that would be entailed, desulphurization won't be resorted to until absolutely necessary, Mr. Cannon explained. Meanwhile, oil companies feel there are many other problems more pressing than desulphurization. He said it appears that desulphurization would add a cent a gallon to the cost of fuel oil.

While one operator of open hearths said his company is trying to determine whether sulphur content has anything to do with the sulphur content of steel, two others asserted they have determined definitely that sulphur content of steel is directly in relation to sulphur content of open hearth fuel.

Qualities of Scrap: The operators agreed unanimously that scrap has been of poor quality and it was urged in the meeting that all poor scrap be rejected by steel producers. Many already are rejecting shipments of inferior scrap but because of the tight scrap supply there are instances where scrap brokers merely reroute a rejected car to another mill which may be desperately in need of scrap. It was agreed that the most effective way to increase the quality of scrap shipped was for all steel mills to reject unsatisfactory shipments. Some shipments have been found to be of good quality in the top of the car, while in the bottom the scrap was of poorer quality, it was reported.

Spectrographic Control: Delivering a paper on "Use of the Spectrograph for Residual and Alloy Control in the Steel Plant," B. W. Bowen of the Spectrographic Laboratory, Research & Development Division, Republic Steel Corp., Cleveland, said that "many developments have conspired to force steelmakers to determine the amount of other elements in the bath besides carbon, manganese, phosphorus and sulphur. Foremost are the ever-increasing requirements of the automobile makers, the fabricators of welded structures and the producers of automatically forged and stamped parts.

"Chief offenders among the nonferrous metals contaminating the bath are copper, tin, lead, arsenic and zinc. In addition, nickel, chromium molybdenum and vanadium, which alloy with iron to improve its physical properties, are often not desirable to have in the bath. All of these elements are encountered in steel scrap in erratic and unknown amounts. Indeed, some scrap containing a beneficial amount of copper or nickel for that grade, may contaminate another heat beyond the allowable limit. Hot metal from the blast furnace also contributes a

(*Please turn to Page* 141)

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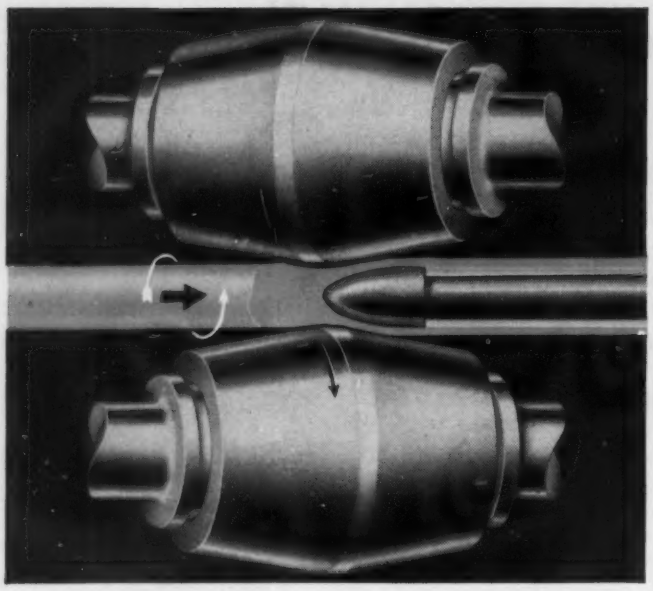
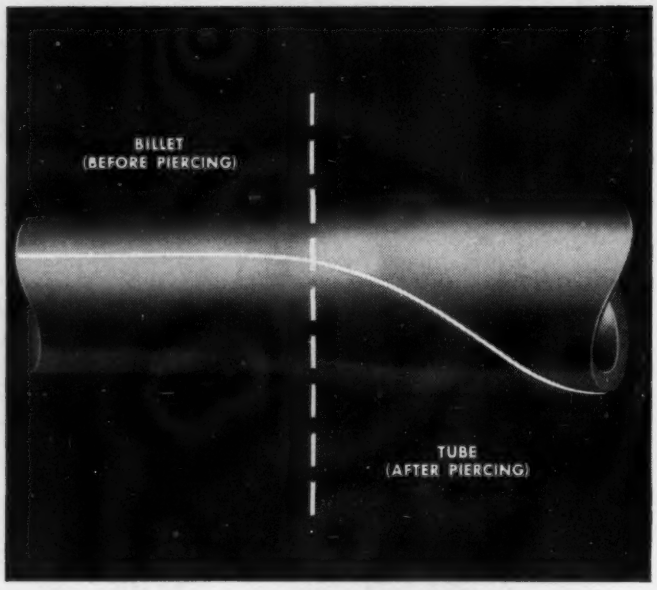


Showing the displacement and working of the steel during piercing operation.



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Reconditioning Cutting Tools (*Continued from Page* 105)

ing considerable data and elapsed time, indicates, first, that the metal bond is too rigid for grinding of milling cutters in a cutter grinder or fixed setup.

On the other hand the resinoid, while yielding better results than the metal, is still not the equal of the modified vitrified bond. The theory of bonding is interesting and may shed some light on the reason for the variation in results with different bonds. The bond acts as the matrix in which the diamond particles are held. As a wheel is used to reduce the extremely hard carbide tips or blades the edges of these particles of diamond dust become dull.

As the edges of these particles are dulled the pressure increases until the particle turns and thus presents a new and sharp edge to the carbide. If the bond is too hard, as seems true of metal and vitrified bonds, the pressure must increase until either the increased friction damages the carbide or the particle is forcibly removed from the matrix.

Experience indicates that the modified vitrified bond now widely used has just the right consistency and holding power. The diamond particles are held until dull and then permitted to turn. Increased diamond wheel life and better cutting action with less likelihood of damage to the carbide cutting element is the observed result. Abrasive manufacturers can be relied on to give the customer excellent guidance in the purchase of this equipment as well as good advice regarding its efficient use.

Technique of grinding is an art and like all arts must be carefully learned by doing. Experience, therefore, is important in the life of a good grinder hand.

All diamond wheel grinding must be done with benefit of a coolant. The nature of the coolant is not nearly so important as that some suitable coolant be used. This does not refer to the use of a flood of coolant; rather to the application of a solvent by means of a wick that prevents the diamond wheel from loading. Hence the term solvent rather than coolant is recommended. Water is as good as any solvent except for its unfortunate tendency to rust machine parts, especially ways of grinders.

Kerosene is the best of all but it has the disadvantage of causing odors and, in some operators, skin irritations. Hence some commercial form of solvent of which there are a number of satisfactory types on the market are generally used. But the application of some solvent or coolant is considered a must for good carbide grinding, according to this experience.

When using "green" wheels or silicon carbide for the snagging of the bits, that is, relieving the steel shank to which the carbide tip or blade has been brazed, a flood of coolant is used to carry away the heat and thus prevent excessive unequal expansion between the carbide and the steel to which it is attached. This is particularly to be observed since steel has a coefficient of expansion and contraction approximately twice that of carbide. Any relatively high localized heating of the shank may cause the brazed tip to be prestressed and therefore result in early failure on the production line or even crack up before leaving the grinding department.

The other item of extreme importance in grinding is the taking of a relatively light cut—not more than half a thousandth and better still less—and taking the cut with a rapid movement of the abrasive wheel over the carbide surface without anything like a dwell. The latter may result in excessive heating which in turn may cause craze marks. The carbide tips or blades are sent to the job with two strikes against them before they start.

Grinding milling cutters will be considered under two distinct heads, namely, grinding brazed tip cutters and grinding cutters with solid carbide blades mechanically held. The brazed tip design is shown in Fig. 2 and the solid bladed cutter is presented in Fig. 1. Both are commonly used and since the latter calls for an entirely different technique of reconditioning it will be considered separately.

Grinding Brazed Tip Cutters: Grinding operations necessary to recondition a cutter of this design will be discussed in terms of the Ingersoll cutter grinder, well known and widely used, on which all essential parts such as the cutter spindle and the wheel head are clearly shown. The cutter is mounted in a manner something like that used for mounting on a milling machine. A wheel 10 in. in diameter is used in this grinder; this will be a silicon carbide wheel for snagging and a diamond wheel for tip blade grinding.

Mount the cutter on the cutter grinder spindle. Use a silicon carbide wheel for grinding the secondary clearance, that is, the necessary clearance on the steel shank to which the tip is brazed. The cutter finger is adjusted, as shown in Figs. 7 and 10. Grinding the secondary clearance can now be performed.

Since grinding secondary clearances on the face also require grinding in steel (the shank) the silicon carbide wheel is left in place on the grinder spindle and the wheel head is swung through 90 degrees to bring it into the position. The finger is again adjusted so that the wheel will grind the proper clearance into the face of the blade.

Remaining operations of grinding are all performed on carbide and hence the silicon carbide wheel will now be replaced with a suitable diamond wheel. The wheel head is moved through the necessary degrees (the quadrant is graduated) to permit grinding the chamfer called for by the specifications. If the specifications indicate no chamfer, grind one in any way; the specifications are wrong unless, of course, the job calls for a sharp 90 degree angle shoulder. But for all other milling operations use a chamfer of 45 degrees by 0.030 to 0.060 inches.

The primary clearance is now ground into the outside diameter. The wheel head is swung back to zero, locked in position and with the diamond wheel properly lubricated this important angle is ground into the carbide tip. A 7 degree clearance angle can be safely used for all materials, including steel and cast iron.

Primary clearance angle is then ground on the face. The wheel head or yoke is again swung through 90 degrees and into the position shown. This operation of grinding the face clearance angle according to the technique recommended here completes the grinding of both the face clearance angle and the dish angle.

Latter is frequently referred to as the grinding of the heel. According to some recommendations the dish or heel angle is as much as 2 degrees. The simplest technique that will yield excellent results, again based on long experience is to set the wheel in the cutter grinder to grind a zero dish angle and at the same time set the finger to grind the necessary face clearance angle. This can safely be taken as 7 degrees for all materials except soft steels, including wrought iron, stainless steel and the nonferrous materials such as aluminum, magnesium and plastics. For these a 15 degree dish angle must be used if satisfactory life results are to be obtained.

Grinding burrs should be removed by honing. Carbide cutters are honed with diamond hones to remove the rough edge left by grinding. Diamond

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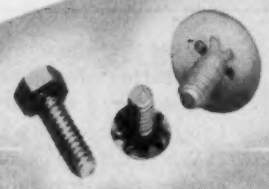

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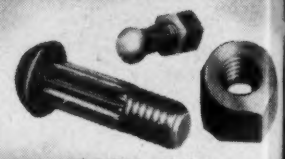

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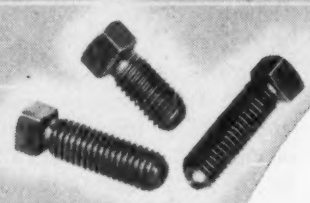

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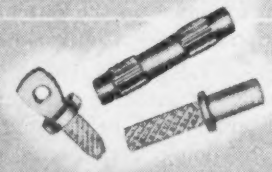

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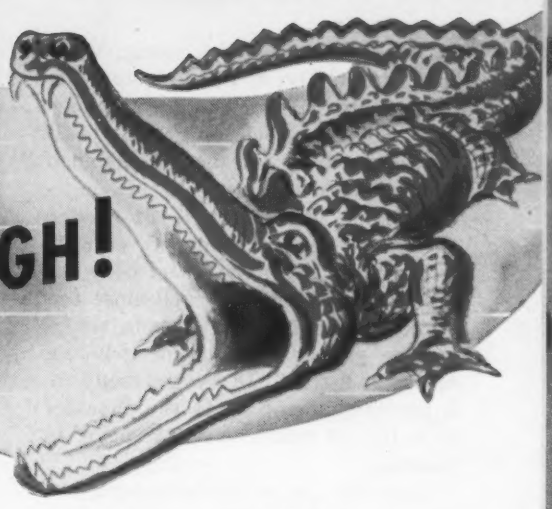

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wheels seldom need dressing; when they do, apply a pumice stone or other material provided for the purpose. Silicon carbide or green wheels are dressed by means of diamond wheel dresser.

Grinding a face mill of design shown in Fig. 1 presents an entirely different problem. The cutter body has been manufactured to such close tolerances that the solid carbide blades can be ground in a jig or grinding block and then set in the body to a permanent stop or to the shoulder of a fly cut taken with one blade in position.

Thus the job of reconditioning revolves around the technique of using the grinding block properly in conjunction with a suitable surface grinder. The jig is shown in Fig. 3; a surface grinder of standard design may be used. However, the grinder presented in Fig. 6 since it is specially designed for this technique is considered more economical from the standpoint of time of grinding and original cost.

In this technique, the outstanding features are the use, first, of solid carbide blades; hence at no time is steel ground. It is not necessary to change from silicon carbide to diamond and back again. The diamond wheel is used for all operations. Second, blades for cutters of all sizes can be reconditioned in this small bench type grinder.

If two blades or 200 must be ground, the reconditioning is all done on this grinder. Third, the angles are presented to the grinder hand in the block and cannot be changed. All that is necessary is using the block in the proper sequence, and since all faces are numbered, it becomes a job calling for a minimum amount of skill. A magnetic chuck shown mounted on the table of the surface grinder, as in Fig. 9, is used to hold the grinding block firmly while the blades are being reconditioned for use.

The first step is grinding the peripheral clearance. This is being done in A of Fig. 8. It is now recommended that but one outside diameter, or peripheral clearance angle be ground into this part of the blade and that the clearance angle be 7 degrees for all materials and for all operations.

If a secondary clearance angle is also to be ground into the outside diameter of the blade—not necessary or recommended according to this experience—then face No. 2 of the block is used as shown in B of Fig. 8.

Grinding the outside diameter is continued until all wear has been removed. In a cutter properly used this should not exceed 0.010-in. to 0.020-in. If a cutter is kept on the job too long the wear land or amount of carbide to be removed will exceed these limits.

In this design of cutter a K land or cutting face, Fig. 10, is ground into the blade at the desired angle. The blade itself is set in the body at a 15-degree positive radial rake angle. But the cutting angle is governed by the material to be milled: For steel the angle is usually a negative of 7 degrees, for cast iron a positive of 10 degrees. A grinding block is selected depending on material type.

That block is then positioned as shown in C of Fig. 8 which automatically reproduces in the blade the angle provided in the block. This land should be somewhat wider than the chip thickness to be removed; approximately half again as wide in order to accommodate the chip thickness which is increased in milling owing to the compression of the material as it is sheared off. For customary and everyday practice this land is made about 0.030-in. to 0.040-in. wide. This will accommodate chip loads as high as 0.025-in. with ease.

Final operation in this technique calls for grinding the face angle as shown in D, Fig. 8. This is a compound angle made up of the dish and the clearance angle. The former or dish angle should be held as close to zero in this milling technique as possible. The blocks make possible the grinding of a dish angle of not more than a few minutes. With this dish angle superior finishes can be obtained whether in roughing or finishing cut; in fact, it is recommended that milling be done in one pass wherever possible. It is no longer necessary to divide the cuts into roughing and finishing to obtain a suitable surface condition. The zero dish angle is shown clearly in Fig. 10.

Angle for this grinding operation provided in the block automatically takes care of the face clearance angle. This for all materials is 7 degrees except for the nonferrous and such ferrous materials as low carbon steels and stainless steels. For these latter a 15-degree clearance angle is called for and provided in a suitable block.

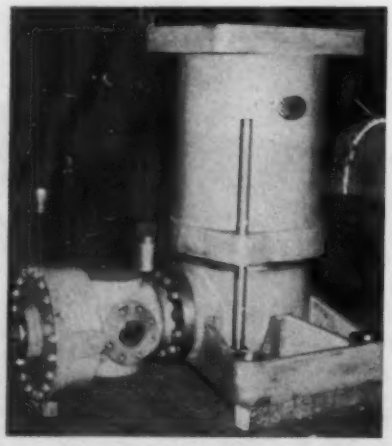
An important observation must be followed in grinding the face clearance angle. If all these cutting edges are to appear in the same plane they must all be ground to the dial-reading on the surface grinder. The operator must note the position of the wheel for the first blade and all blades must be ground to the same setting. Better still, bring the setting of the first blade to zero on the dial, and do the same for all blades that follow in the set.

Moreover, all outside diameters should be ground with one setting of the grinding block for all blades in a set. Likewise all K lands and then finally all face angles.

If an 8-bladed 8-in. cutter is being used on a job, more than 8 blades should be ground to insure having spares in case of accidental breakage of one or more blades. If the job is a production run, 100 or more blades should be ground to the same setting. If this is done then the diamond wheel wear must be taken into account, though this is small, by checking the distance from the bottom of the grinding block to the face cutting angle on the blade; make certain the one-hundredth and first blades are alike.

A wick, in some such form as shown in Fig. 7 should all times carry a sufficient amout of solvent such as kerosene or a kerosene derivative to the diamond wheel. This prevents "loading" of the wheel, reduces friction between the wheel and the carbide and makes for free cutting.

If these suggestions are followed carefully in the grinding, a first step has been taken toward good milling results on the production line.



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 (*Continued from Page* 109)

easy to hold metal temperatures within close limits. When no melting is being done, the current supply is reduced automatically to precisely the amount required to make up for the very small heat loss. At no time is any part of the furnace above metal temperature. A small blower (not shown in Fig. 4) circulates air through the space around the primary coil, which is electrically insulated with fiber glass tape, and keeps the coil cool.

A heel of metal is always held in the furnace but the space above can be filled with slabs of zinc or alloy when starting a run. Thereafter, new metal is added only as needed to retain the desired level. Furnaces used only for melting, as distinct from holding, do not have a gooseneck casting, of course, and often are equipped with trunnions for tilting if large transfer ladles are to be filled. Only furnaces of very large size require a foundation, others normally being set on the floor with no firebrick below, as the entire outside of the furnace remains cool. When desired, the gooseneck nozzle is provided with a resistance heater embedded in a refractory coating to keep the nozzle at a predetermined constant temperature. No flame then need be applied even to the nozzle.

Reduces Gas Absorption

Alloying is very readily done as follows, especially in furnaces used for melting only, and without raising the charge above 850° F. This low temperature, of course, helps to reduce gas absorption, for the latter tends to increase at the higher temperature attained when separate melting of the "hardener" is done. Rod, cast to about 1½-inch diameter and having the composition of the "hardener" required can be purchased from the smelter. This rod normally contains the correct specification proportions of aluminum and magnesium (plus copper, if No. 2 or No. 5 Zamak alloys are used.)

The proper weight of rod for a given weight of zinc is cut off and one end of the rod can be inserted in one of the vertical furnace passages (d or e Fig. 4). There the rod melts rapidly and is mixed uniformly with the molten zinc, feeding down (say under a weight placed on the top end) as melting proceeds, Fig. 1. As the metal continues to circulate continuously, it is uniformly mixed and no segregation occurs.

One die casting plant using these furnaces for melting zinc states that iron content remains at the lowest point experienced in this plant and considers this a marked advantage, as casting conditions are improved and both drossing losses and scrap casting losses are reduced.

According to A. W. Sundwick of Fisher Body-Ternstedt Division, General Motors Corp., who has made a close study of the causes of imperfections in zinc die castings, "High iron content can contribute to practically any of the casting difficulties and surface defects known to the die caster. Special care should always be taken to keep the iron content as low as possible. The aluminum content, if kept within specification, will do much in this direction but further reduction can only be obtained by blending with higher purity alloy." Presumably, the last phrase relates to remelting sprues and runners.

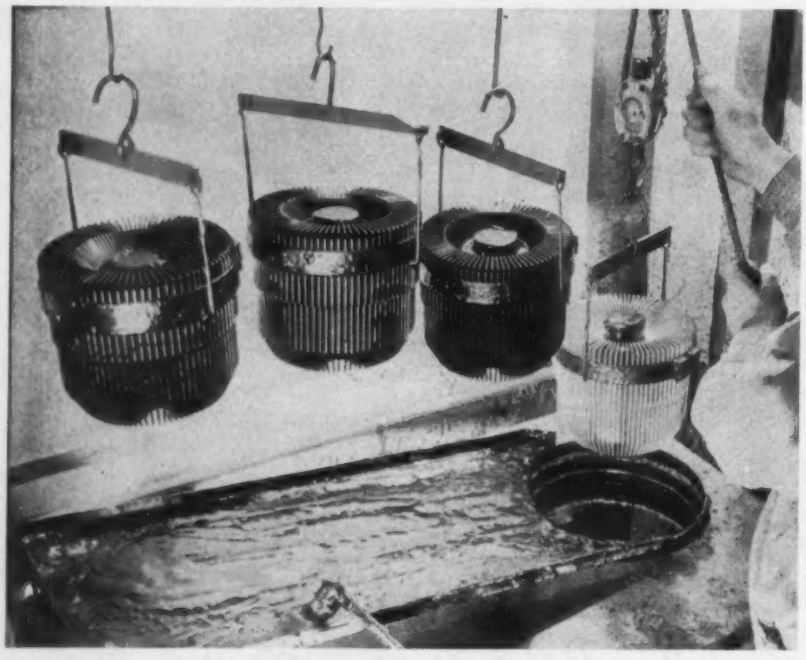
Floats Off Iron

In the induction furnace, the molten metal never comes in contact with iron (though in holding furnaces there is contact with the gooseneck casting and plunger) and this is believed to have much to do with keeping iron content low. Although the aluminum content in zinc alloys does help to reduce iron pickup, some does occur, especially if scrapped castings containing steel inserts are allowed to get into remelt furnaces. According to Sundwick, aluminum helps to float off iron by forming iron-aluminum compounds but this results in lowered aluminum content and, if this content drops below 4 per cent, castings free of defects become more difficult to obtain.

In any event, it is advantageous to keep iron low and aluminum well within specification limits. Induction furnace melting is believed to aid on both scores. Fewer defective castings are reported and some tests show that drossing losses drop when melting from the same batch of metal is done in the induction furnace.

In most sizable die casting plants, alloying is done in melting furnaces. The alloy is then either cast into ingots for transfer as needed to furnaces at machines or is run into ladles which are transferred, usually by monorail trollies, to holding furnaces at machines. The latter is the preferred method, as pigging losses are avoided and there is likely to be less variation in metal temperatures.

Carrying molten alloy in ladles and pouring it into holding furnaces, however, is fraught with hazards be-

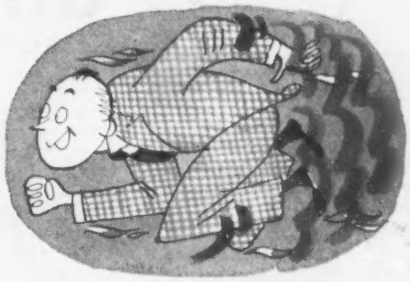


DIP, DRIP, DRY: A copper radiator assembly, used to dissipate the heat given off by large electronic tubes when in operation, is shown here being lowered into a tank of decorative enamel by a worker in the Brooklyn plant of Amperex Electronic Corp. Wooden plug in the center of each radiator is replaced with the tube in a subsequent operation, the entire unit then being ready for use

Sid was sick of shortages—so...

1. . . . he finally decided to convert to aluminum.

2. His competitor, Carl, just laughed. "Aluminum can't be adapted to Sid's product," Carl chortled.

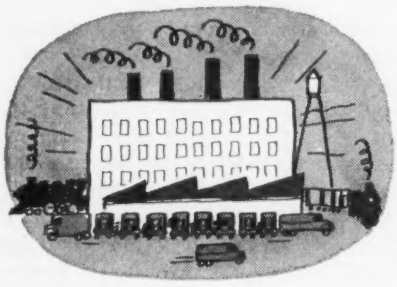


3. But Sid was off like a fireball! For he'd learned that alloys of Kaiser Aluminum could meet almost every type of operation. And it could be formed, drawn, spun, brazed or joined.

4. "So alright, he did it," shrugged Carl, "but the cost will break him."

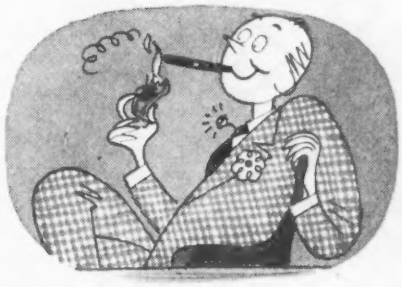
5. But foxy Sid found that though aluminum costs a little more to begin with, savings in handling, fabricating, finishing and shipping more than made up the difference.

6. Still, die-hard Carl wouldn't budge. No siree, he'd wait for the metal he had *always* used.



7. Meanwhile, Sid's product sold like popcorn at a circus. Folks preferred aluminum products. Result: Soaring production cut costs still further.

8. Now, would you rather be Carl?



9. . . . or Sid?

MORAL: Alert manufacturers—making everything from general appliances to residential buildings, from garage doors to heating and ventilating ducts—are speeding production, nailing down new markets . . . by converting to *Kaiser Aluminum.* The problems solved by them can help *you.* So call in a Permanente engineer *today!*

Ready to serve you—*today...*

Kaiser Aluminum

a Permanente Metals product

DISTRIBUTED BY PERMANENTE PRODUCTS COMPANY, KAISER BLDG., OAKLAND, CALIFORNIA . . . WITH OFFICES IN:
Seattle • Oakland • Los Angeles • Dallas • Wichita • Kansas City • St. Louis • Atlanta • Minneapolis • Milwaukee • Chicago
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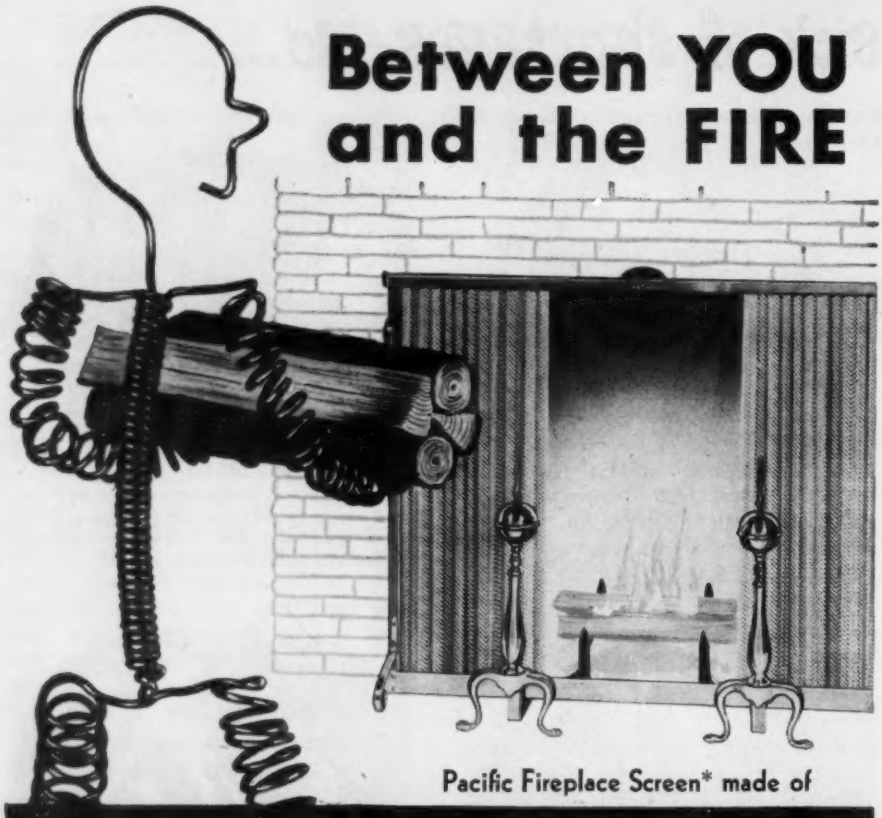
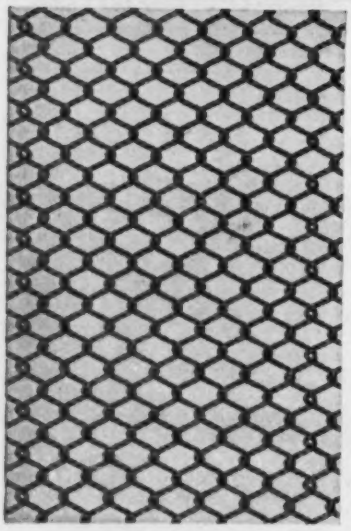
Between YOU and the FIRE



Pacific Fireplace Screen* made of

KEYSTONE WIRE



Note the fine, expert weaving of Pacific fireplace screen, requiring steel wire of highly uniform thickness and temper.

Whenever you find outstanding value in a product, you usually find plus quality in the materials used.

This is true of Pacific* fireplace fixtures — the only fireplace ensemble with andirons on the outside of screen which protects the andirons from smoke and tarnish.

Pacific screens are made of Keystone wire in beautiful *old-gold* finish. The wire is produced by a special wet-drawn process that adds lustre and smoothness. It is of extremely uniform temper — important for quality weaving.

Pacific is the largest manufacturer of fireplace screens on the West Coast. We are proud that Keystone wire meets their exacting requirements.

KEYSTONE
MUSIC SPRING WIRE

Pacific Fence & Wire Co., Portland, Oregon

SPECIAL ANALYSIS WIRE for all industrial purposes

KEYSTONE STEEL & WIRE CO., Peoria 7, Ill.

sides which the labor of at least one man, who must shift and operate the ladle, is required. In addition, the carrying system is not inexpensive and is accompanied by heat losses.

To overcome these disadvantages, Ajax has developed a system of electrically heated launders by which molten metal is carried from an induction heated melting furnace to as many holding furnaces as desired without any hazard or labor other than the attendant, needed in any case, at the melting furnace. Fig. 3 shows a layout of this kind and one identical in principle, though different in physical arrangement, is already in highly successful commercial use.

Launders or heated troughs for carrying the metal are made up in sections, as shown in Fig. 2, and have a removable cover of heat insulating refractory that is sheathed with steel outside and carries, on its lower surface, (turned upward in Fig. 4) a resistance heating element of sufficient capacity to melt the zinc alloy, should it ever be permitted to freeze.

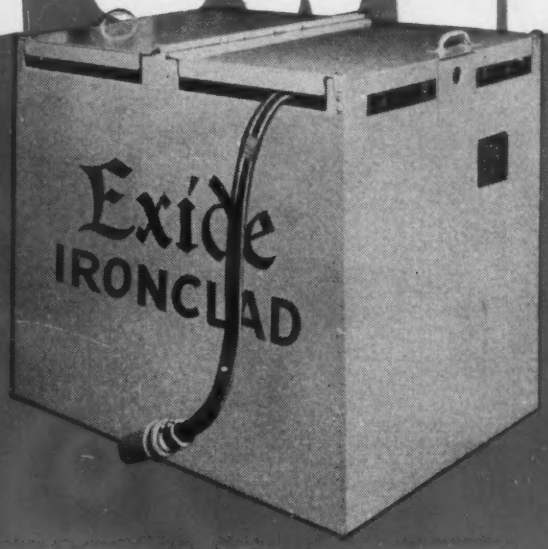
Such launders can be built up to any length desired and are provided with covers in which heating element current is controlled automatically to keep the temperature of the zinc alloy within the desired range. Branches are lead off as needed to supply holding furnaces and can be dammed, if necessary, to freeze the metal and stop flow if the holding furnace has to be taken out of use.

In such a system, of course, the molten metal finds its own level and the total capacity can be made of any size needed to meet operating conditions. Normally, the capacity would be such that metal level will vary not more than 1 inch even if refilling is intermittent, say in batches of 500 pounds of molten zinc. This is believed to be much less variation than when holding furnaces are charged intermittently by conventional methods. Because of good heat insulation, heat losses are minimized and an estimated power input of about 0.5 kilowatts per foot of launder is sufficient to maintain desired operating conditions.

It is significant that, in such a system, there is no handling of metal except at the melting furnace and, of course, there is no occasion to produce pigs, as the metal flows to all holding furnaces in all of which the level is uniform. For large installations, two or more induction melting furnaces may be needed but these furnaces are designed for continuous use, 24 hours a day, and maintenance work on them is seldom needed. Furnaces of 150 kilowatt capacity produce 3000 pounds of molten zinc alloy per hour.

HYDROLECTRIC LIFT TRUCK

DEPENDABLE POWER



EXIDE-IRONCLAD POWER AND BATTERY ELECTRIC TRUCKS

The efficient, cost-cutting team that speeds materials handling

You gain all along the line when your materials are handled by electric trucks and Exide-Ironclad Battery Power. This modern efficiency team keeps goods moving in greater volume, and saves time and money all day long.

Exide-Ironclad Batteries are preferred for electric truck service because of their great power and dependability . . . a result of special Exide-Ironclad construction, which is unlike that of any other battery.

One important Exide-Ironclad feature is the positive plate which consists of slotted tubes containing the active material. So tiny are these slots that, while permitting easy access of the electrolyte, they prevent the active material from readily washing away. The results are high power ability, longer life, greater economy and safety.

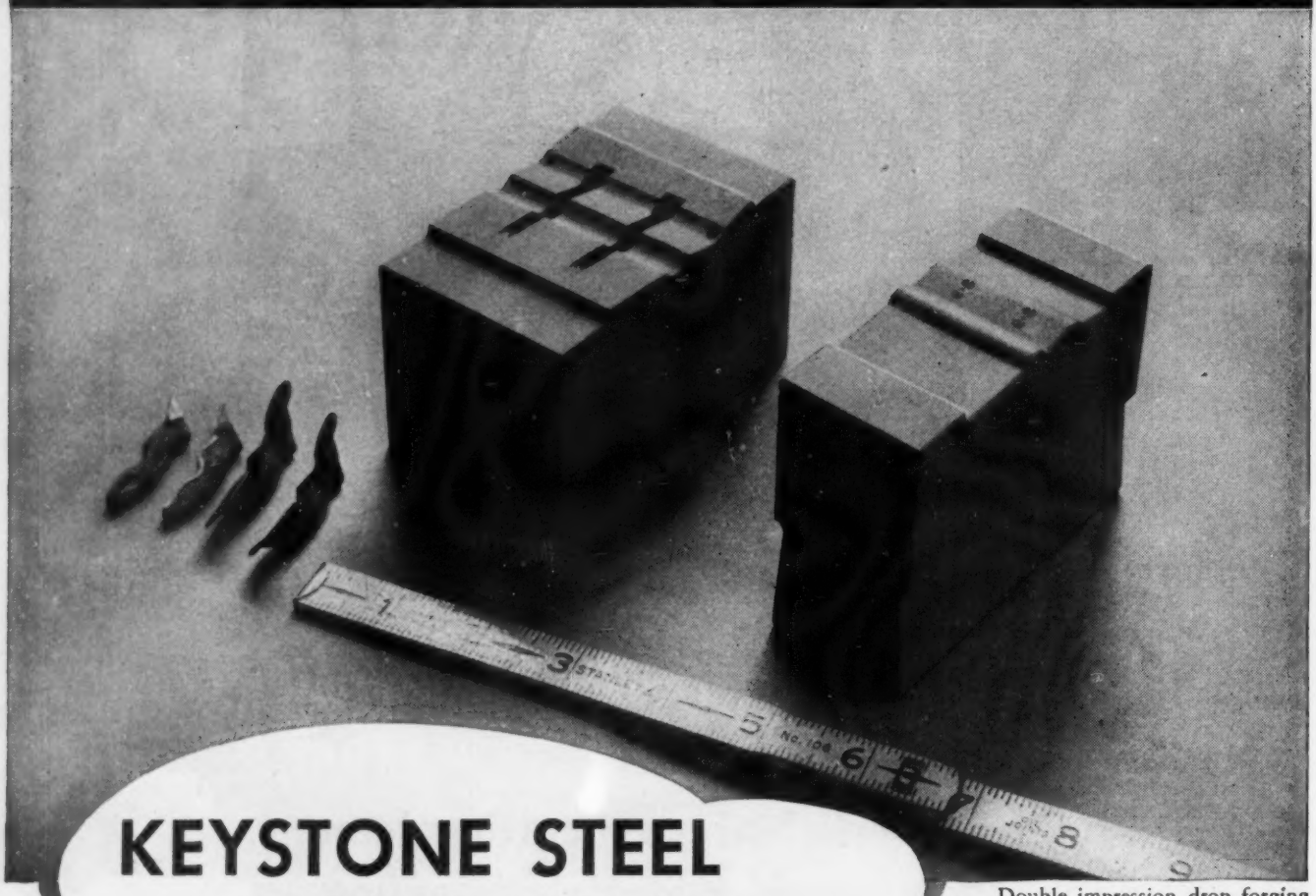
Write us for a FREE copy of Exide-Ironclad Topics which contains "Case Studies" of material handling problems. It tells how to cut handling costs up to 50% . . . covers latest developments in handling materials from receiving to shipping.

THE ELECTRIC STORAGE BATTERY COMPANY
Philadelphia 32

Exide Batteries of Canada, Limited, Toronto

HYDROLECTRIC LIFT TRUCK

DISSTON . . . for Finer Tool Steels



KEYSTONE STEEL

FOR HOT WORK APPLICATIONS WHERE TOUGHNESS AND RESISTANCE TO HEAT CHECKING IS IMPORTANT

Double impression drop forging die, made of Keystone Steel, for hot forging inserted tooth saw teeth.

Because of its resistance to heat, its toughness and high compressive strength, Keystone Steel has become one of the most popular members of the large family of Disston Tool Steels.

Keystone Steel is exceptionally well suited for the making of die blocks, particularly blocks having sharp impressions and subject to breakage. It is being used with much success where the mass of the work is not great enough to bring temperatures in the tool above 600°F. And where toughness is specially important, Keystone Steel has shown many examples of its ability to outperform any other steel regardless of price.

Keystone is also recommended for hot punches, shear blades, chisels, pipe cutters, welded tube-bending mandrils and similar applications.

ANALYSIS

Carbon	.50%	Tungsten	2.00%
Chromium	1.10%	Vanadium	.20%

•

HAVE YOU A TOOL STEEL PROBLEM?

Disston metallurgists and engineers will be glad to help you select the *right* tool steel to fit your requirements . . . without charge or obligation.

•

STEEL—Everybody who wants to obtain steel can help himself to get it by immediately starting scrap into the channels that serve steel mills.

HENRY DISSTON & SONS, INC., 1126 Tacony, Philadelphia 35, Pa., U.S.A.

Technical Papers

(*Concluded from Page* 118)

and Metals for Resistance to Surface Cracking: By Earl Ingerson, Carnegie Institution, Washington. Bore surfaces of used guns commonly show a pattern of cracks in various degrees of development. It has been suggested that these cracks may aid erosion by providing channelways for the gases, eventually leading to tearing out of blocks of metal.

Under the general studies of gun erosion conducted at the Geophysical Laboratory this factor was considered. Resistance to surface cracking offered by gun steel and by various other materials that might be used in the bores of guns was also determined at the laboratory.

An Electrolytic Method for Pointing Tungsten Wires: By W. G. Pfann, Bell Telephone Laboratories, Murray Hill, N. J. Electropointing method described in this paper was developed and used in manufacture during the war. It is simple and rapid method and requires the use of only elementary apparatus.

Method is flexible, as a difference in wire size or in the point configuration desired involves little more than a change in the value of the shut-off current. The procedure has a very general aspect in that it is possible to produce points of any desired degree of sharpness on tungsten and molybdenum. Furthermore, by selecting suitable electrolytes, cathodes and voltages, the principles discussed should be applicable to a variety of metals.

Oxygen for Decarburization

(*Concluded from Page* 128)

limited amount of undesirable elements, depending chiefly upon the kind and amount of turnings and borings in the burden.

"More practically, the situation can be summarized by saying that technological advances have extended the inherent average physical properties of steel much closer to its limit. To obtain the last degree of ductility, or weldability, without sacrificing a pound of strength, melters, chemists and metallurgists must see to it that some elements encountered in the bath are kept out and others kept in."

The use of the spectrograph in obtaining this control was outlined by Mr. Bowen who touched on both the limits of the method and the advantages of the spectrographic method in his paper.

BAKER TRUCKS

at Western Brass Mills have given the equivalent of

65 YEARS OF SERVICE

-and are still going strong!

How long should Industrial Trucks last? That depends on the make of truck and on the user's maintenance policy much more than on the tough services they perform. For example—in 1923, the Western Brass Mills bought 3 Baker Low-Lift Platform Trucks for their East Alton, Ill. plant. Since then they were used continuously on all shifts. During the war they operated round-the-clock—seven days per week. Since the end of the war they have been on three 8-hour shifts six days per week. Thus each has been in continuous service the equivalent of 60 to 65 years of 8-hour days!

The trucks are not pampered. They were designed for the rigorous service expected of them. Day after day they handle brass-castings, pig copper, coiled strip, etc.— and are exposed to the strenuous conditions typical in a brass rolling mill. Their long life is a tribute to their rugged construction and to an excellent maintenance program pursued in the plant.

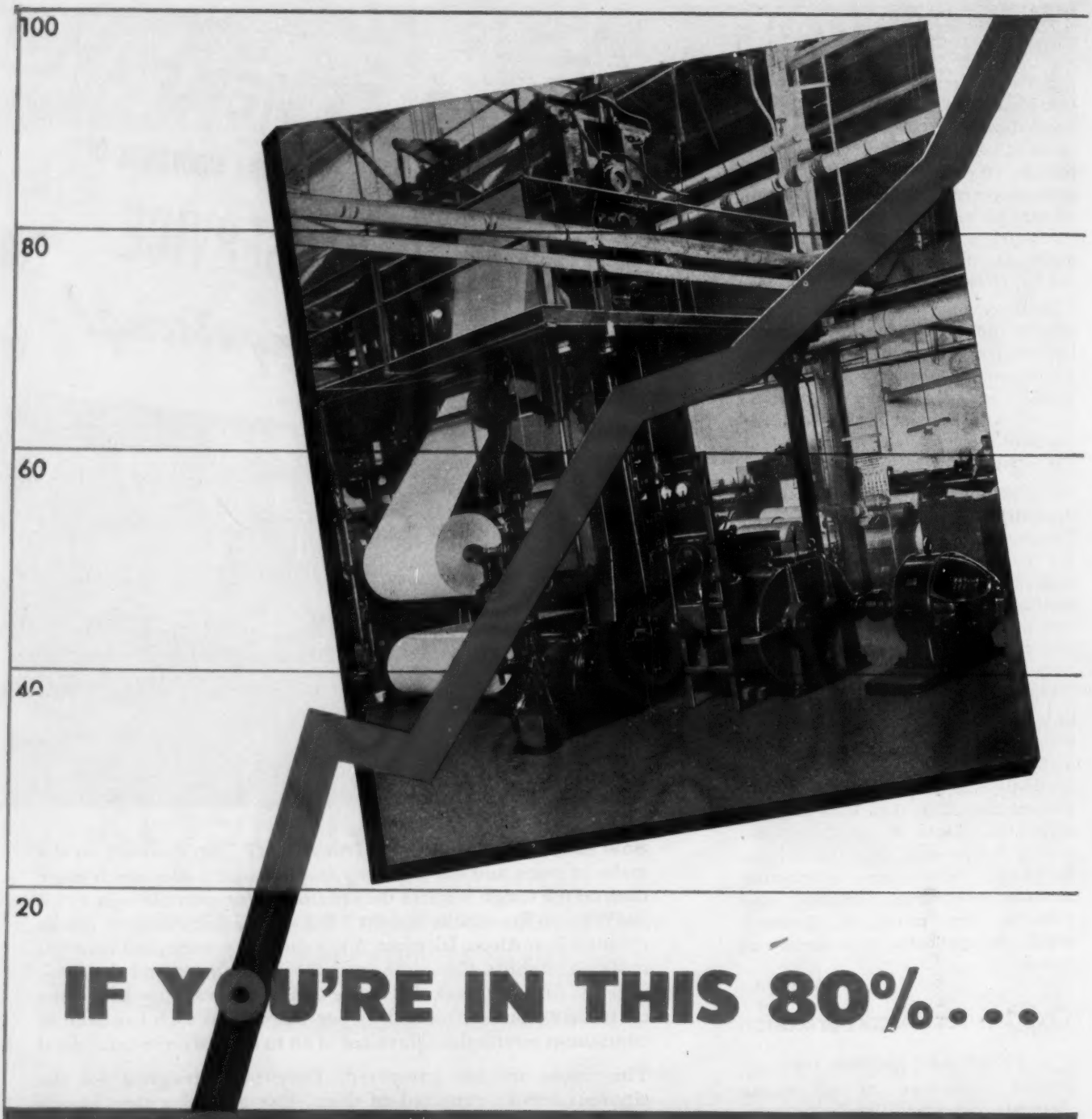
Here is convincing proof that, all factors considered, Baker Electric-Powered Industrial Trucks cannot be surpassed for low-cost material handling.

Get all the facts before you buy industrial trucks. A Baker Material Handling Engineer is at your service.

See us at Booth 303
Materials Handling Exposition
CLEVELAND — JANUARY 12-16

BAKER INDUSTRIAL TRUCK DIVISION
of the Baker-Raulang Company
2167 West 25th Street • Cleveland, Ohio
In Canada:
Railway and Power Engineering Corporation, Limited

Baker INDUSTRIAL TRUCKS

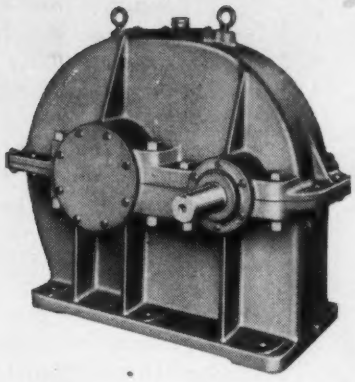


IF YOU'RE IN THIS 80%...

here are 6 advantages you need

WESTINGHOUSE

MEMBER OF AGMA



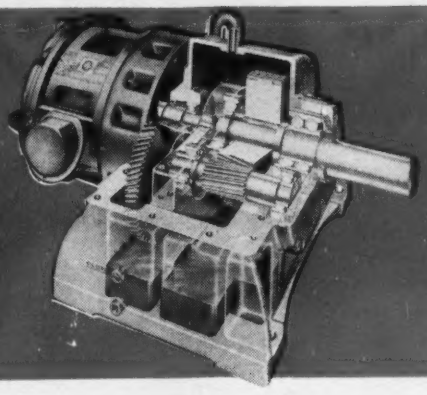
This Type SH speed reducer is a single-reduction unit which is furnished in thirteen standard ratios in each of twelve sizes. The Type DH speed reducer, which is a double-reduction unit, is offered in fifteen standard ratios in each of twelve sizes.

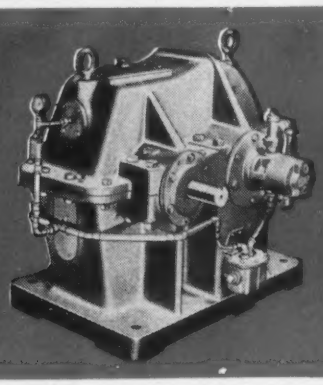
Since 80% of all machines run slower than their prime movers, you'll want to capitalize on the six benefits of the packaged designs in Westinghouse speed reducers:

1. Higher power efficiency (one plant boosted it from 80.9% to 85.4%).
2. Less servicing . . . only semiannual lubrication needed.
3. Maintain positive alignment of drive and driven machine.
4. Long service life through single helical gearing heat-treated by exclusive Westinghouse BPT process.
5. Minimum power loss with antifriction bearings.
6. Precision operation from hob-cut gears.

In addition, you get undivided responsibility with motor and gears supplied by one manufacturer. You have your choice of twenty-four sizes of Westinghouse speed reducers for drives up to 1,000 hp—Types SH and DH—with speed reduction ratios of 2.82 to 70.5.

Ask your nearest Westinghouse office today to show you how to get the best in speed reduction for your plant with Westinghouse speed reduction matched unit drives. Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Penna. J-07253





FOR DRIVES FROM 1 TO 75 HP

CHOOSE GEARMOTORS

For all types of drives, Westinghouse gearmotors offer peak performance in modern speed reduction. Easy to install, service and adapt to varied conditions. Three types—A, C, and E—supply output speeds from 1,450 to 16.5 rpm, all available with single-phase, polyphase, or d-c motors.

HANDLE ALL YOUR HIGH-SPEED JOBS

WITH THESE MATCHED-UNIT DRIVES

Now you can handle all your high-speed drives with these Westinghouse Type SU speed increasers for jobs up to 2,000 hp and 9,000 rpm. Units are available in 30 sizes⇒ with gear ratios of 1.25 to 3.25 up to 2 to 12.

***Here's a complete picture story* of industrial geared drives and their uses in every industry. Ask for your copy of B-3730 today, on your business letterhead, please.**

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PLANTS IN 25 CITIES . . . OFFICES EVERYWHERE

4 out of 5 drives need speed reduction

BY YEARS OF SERVICE
AS A RELIABLE
CORROSION RESISTANT MATERIAL

WHEN materials come out of the laboratory and into hard, work-a-day, practical use theory stops and experience begins. Gone are the "ifs" and "maybes". A month—a year—ten years, and the final answer is written on their real value. Written not in essays and monographs but in the cold dollars and cents of operating costs and product reliability.

Of all the "stainless" materials none have a finer record under the scrutiny of time than the "18 and 8" alloys. Castings made from this material in our foundry twenty years ago are still rendering reliable service today. That is why we *know* that castings which we will pour tomorrow in our alloy shop will be serving you just as well twenty years from now.

The specifications of one of the Circle Ⓛ family of "18 and 8" Stainless Alloys are given at left. For complete information on these tested and proved corrosion resistant materials, write to us.

LEBANON CIRCLE Ⓛ 22M

NOMINAL ANALYSIS

Carbon Max.	0.07
Silicon	1.25
Manganese	0.75
Chromium	19.50
Nickel	9.00
Phosphorus	0.12
Selenium	0.25

NOMINAL PHYSICAL PROPERTIES

Tensile Strength	80,000
Yield Point	40,000
Elongation in 2"—%	45
Brinell Hardness	160

LEBANON STEEL FOUNDRY • LEBANON, PA.
"In The Lebanon Valley"
ORIGINAL AMERICAN LICENSEE GEORGE FISCHER (SWISS CHAMOTTE) METHOD

LEBANON *ALLOY AND STEEL* Castings

CIRCLE L

Welding and Cutting

(*Continued from Page* 112)

dling as possible. The welding rod is usually of good quality without high-carbon or high-alloy additions.

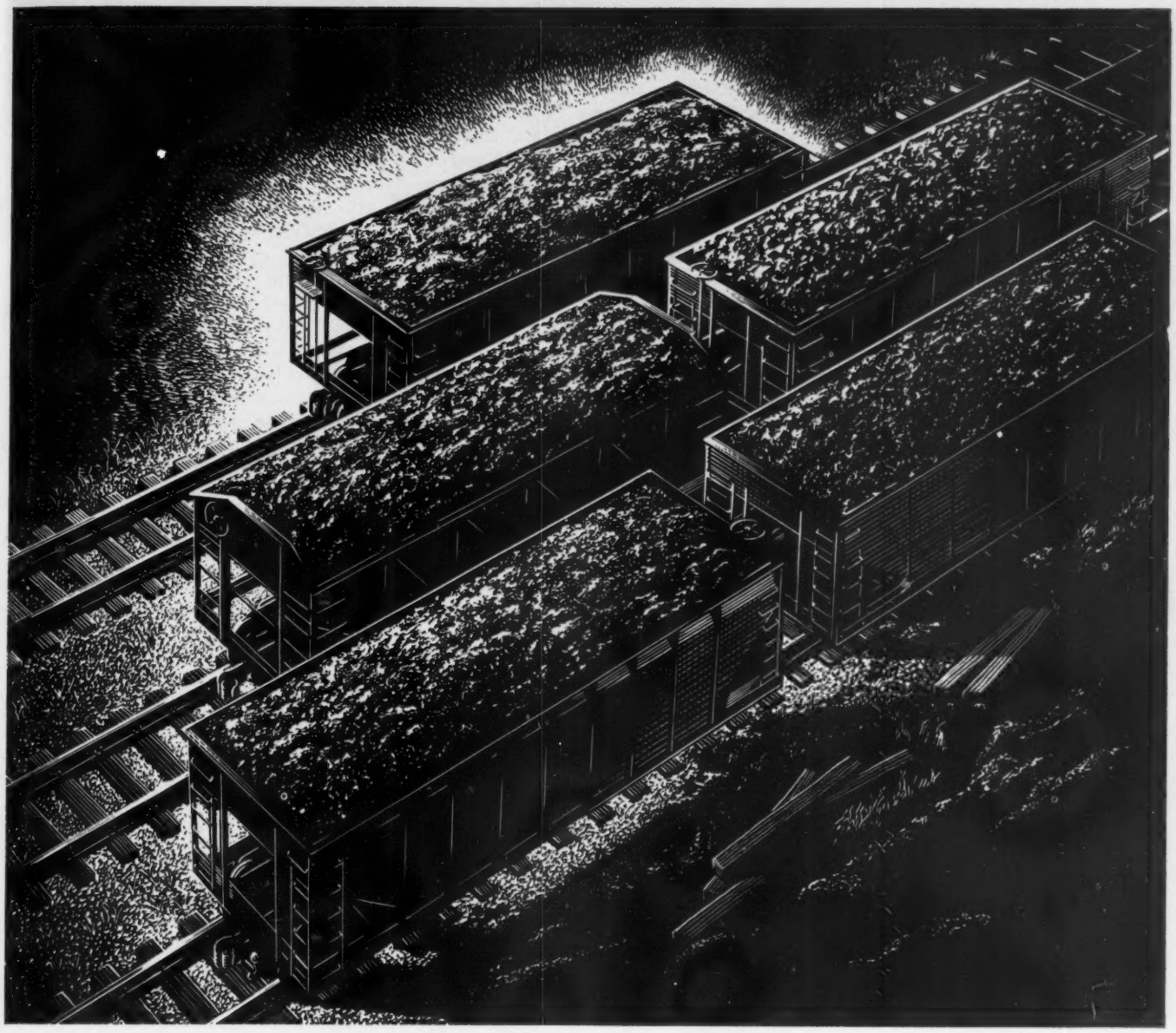
When high-carbon steel is welded, the operator must consider properties developed in the base metal by the original special heat treatment. As with any heat-treated steel, the welding temperature will locally destroy properties gained by the heat treatment. These properties are usually restored by proper heat treatment after welding, which sometimes may be a rather complicated procedure. When high-carbon steel parts are welded, it is quite desirable to preheat them just enough to obtain proper fusion. Overheating should be avoided.

In welding relatively thin parts, there will be considerable intermingling of the base metal and the metal from the welding rod. A relatively low-carbon rod can be used, with certain alloy additions to improve its physical properties. When heavy sections or other parts are to be heat-treated subsequently for increased hardness and strength, high-carbon rod should be used.

Cast iron can be fusion welded or bronze-welded. The latter procedure is usually desirable because it can be done at a lower temperature and gives increased ductility in the weld metal. Fusion welding is needed, if the color of the weld must match the base metal, as in reclaiming defective gray iron castings at the foundry. It is also needed if the welded part is to be subjected in service to temperatures much over 500° F, as bronze loses strength rapidly at elevated temperatures.

Malleable iron can also be welded satisfactorily by bronze-welding. With malleable iron, fusion welding would not generally be satisfactory, because the heat of fusion would destroy the malleable properties, and thus lengthy heat treatments would be necessary to restore the iron to its original condition. Such treatment is not warranted with malleable iron because of its cost. Low temperature of bronze-welding makes it rather simple to weld such castings without impairing the malleability.

Practically all nonferrous metals and alloys can be welded with the oxy-acetylene process. Certain technical details should be observed. For instance, the operator should know that aluminum collapses suddenly upon reaching the melting point without any visible color change. Also, aluminum and many of its alloys are weak when hot, a so-called "hot-short" con-



What do you pay for parking?

Plenty! Just count up the number of days railroad cars stand on your siding waiting to be unloaded.

Then figure out your overtime car rental fees—your demurrage charges. Sizeable sum, isn't it?

Maybe you look on this parking expense as necessary overhead. That used to be true. But it isn't any more!

Today there's a new way to empty hopper cars. It's fast, efficient and economical. It helps you wipe out those "fines" for overtime parking.

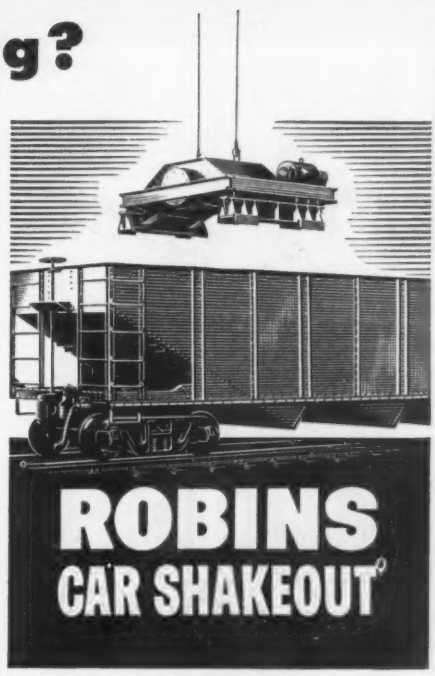
It's the new Robins Car Shakeout! It *shakes* the material in the car loose . . . enables it to flow freely and quickly through the hopper doors. It empties 50- or 70-ton cars "broom-clean" in as little as 90 seconds. It unloads them no matter how tightly the load is packed. It even empties loads that are frozen solid!

Actual field operations by hundreds of users prove that this new method of unloading hopper cars is as much as twelve times faster than manual unloading.

The Robins Car Shakeout performs its operation with no damage to the car . . . with no danger to the operator. It saves you hours of labor and much time and money.

Why not find out how a Robins Car Shakeout will help you eliminate overtime parking fines?

A note on your company letterhead to Dept. N-2, Robins Conveyors Division, Passaic, N. J., will bring you this new booklet about the Robins Car Shakeout. Or ask for a Robins engineer to tell you the complete story in person. No obligation!



ROBINS CONVEYORS DIVISION, Hewitt-Robins Incorporated, Passaic, N. J.

dition. Therefore, during welding, areas that are to be raised to the welding temperature must be adequately supported. Furthermore, when aluminum is exposed to the atmosphere, an oxide forms rapidly on the surface. This must be removed before a sound weld can be made. Surface must be properly cleaned before welding, either mechanically or chemically. During welding a flux must be used to protect the weld from the atmosphere.

During welding, heat is dissipated more rapidly in copper than in steel, because the copper has good heat conductivity. Although copper has a lower melting point than steel, more heat is necessary to make a weld. This may be accomplished by preheating the base metal. A larger tip or head is generally used for copper than for a similar thickness of steel. There are two types of copper: Ordinary electrolytic copper which contains oxygen in the form of cuprous oxide; and eutectic mixture of copper and cuprous oxide which may act to reduce the strength of the weld as much as 60 per cent. What is known as deoxidized copper is available commercially in the form of rods, tubes, sheets, and plates. This should be used wherever possible since it is free from oxides and thus eliminates the difficulty just described. A welding rod of deoxidized copper should be used. A flux is generally not required.

Flame-hardening is another process made possible by high temperatures and rapid rate of heat transfer. Surfaces of a quench-hardening ferrous material can be heated above its critical temperatures by oxyacetylene flames. It is then cooled by a suitable quenching medium, usually water. This results in a hardened case without change in the composition. A hardened case of any reasonable depth and contour can be produced, and confined to those areas where hardness is necessary, leaving rest of metal in ductile condition.

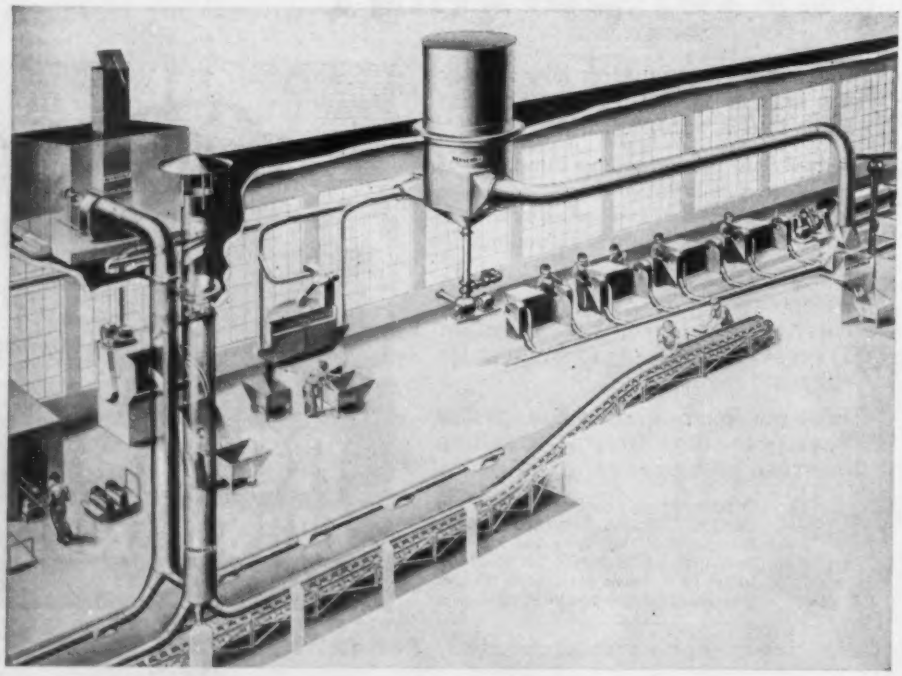
Flame-softening by the oxyacetylene flame may also be used to reduce locally the hardness of a metal surface. This process is often used to soften the cut edges of hardenable steels, for the local softening of final electric arc weld passes, and also for softening flame-cut risers on steel castings to facilitate subsequent machining. Application of this technique is somewhat similar to that of flame-hardening except that the steel surface is not quenched and the resultant slow cooling gives the desired annealing effect.

The oxyacetylene process can perform other welding applications of great variety, such as bending, straightening, and forming various steel and other metal sections. For example, the wrinkle-bending of pipe is an economical operation and does not reduce the internal diameter or wall thickness of the bent section. Metal tubing can be quickly end-formed to eliminate deep drawing and other operations. Ends of tubes can be readily closed to make tops or bottoms of containers by a flame-spinning process.

In this process, the tube is usually held horizontally on a rapidly spinning chuck of a lathe. Oxyacetylene flames rapidly heat the working end. A forming tool of proper shape is forced in by hand and causes the end of the tube to collapse into the proper shape or seals it off completely. During the war, this latter operation converted numerous lengths of tubing into closed containers without the necessity of forming dies, punch press work, and joining ends of the tubing.

In recent years, a somewhat different method of welding has been introduced. This weld is made by pressing together the clean, square faces of two sections to be welded under moderate pressure and then heating the joint by oxyacetylene flames to a plastic stage ranging from 2100 to 2400° F. The pressure causes parts to unite before the ends become molten. Of course the completed joint has a definite bulge or upset. This has proved to be an economical method for joining large-diameter overland pipe lines, as well as small-diameter pipes for industrial installations. It is being used by railroads to produce solid rails hundreds of feet long.

By far the greatest proportion of oxygen in this country is used for cutting iron and steel. In this application, the surface of the metal is raised to the ignition temperature by oxyacetylene preheating flames which surround the central orifice of the cutting nozzle. Through this orifice a jet of pure oxygen controlled by a separate valve, is directed at the heated area. This operation actually starts at a temperature below the melting point of the steel, and re-



DUST CONTROL: This foundry cleaning room, with all dust and fume-creating operations controlled by a multi-wash system is one recent development in maintaining clean air in all working zones. Fume control of hot castings conveyor is shown in left foreground. Cool air entering through vertical tube at right ventilates the tunnel, while fume-laden air goes up the other tube for discharge into the atmosphere. Photo courtesy Claude B. Schneible Co., Detroit

At Home All Over The World

For over 60 years "Greenfield" has been sending its tools to markets all over the world. Today, "Greenfield" products are handled through 72 factory agents and more than 1,100 stocking distributors in foreign countries.

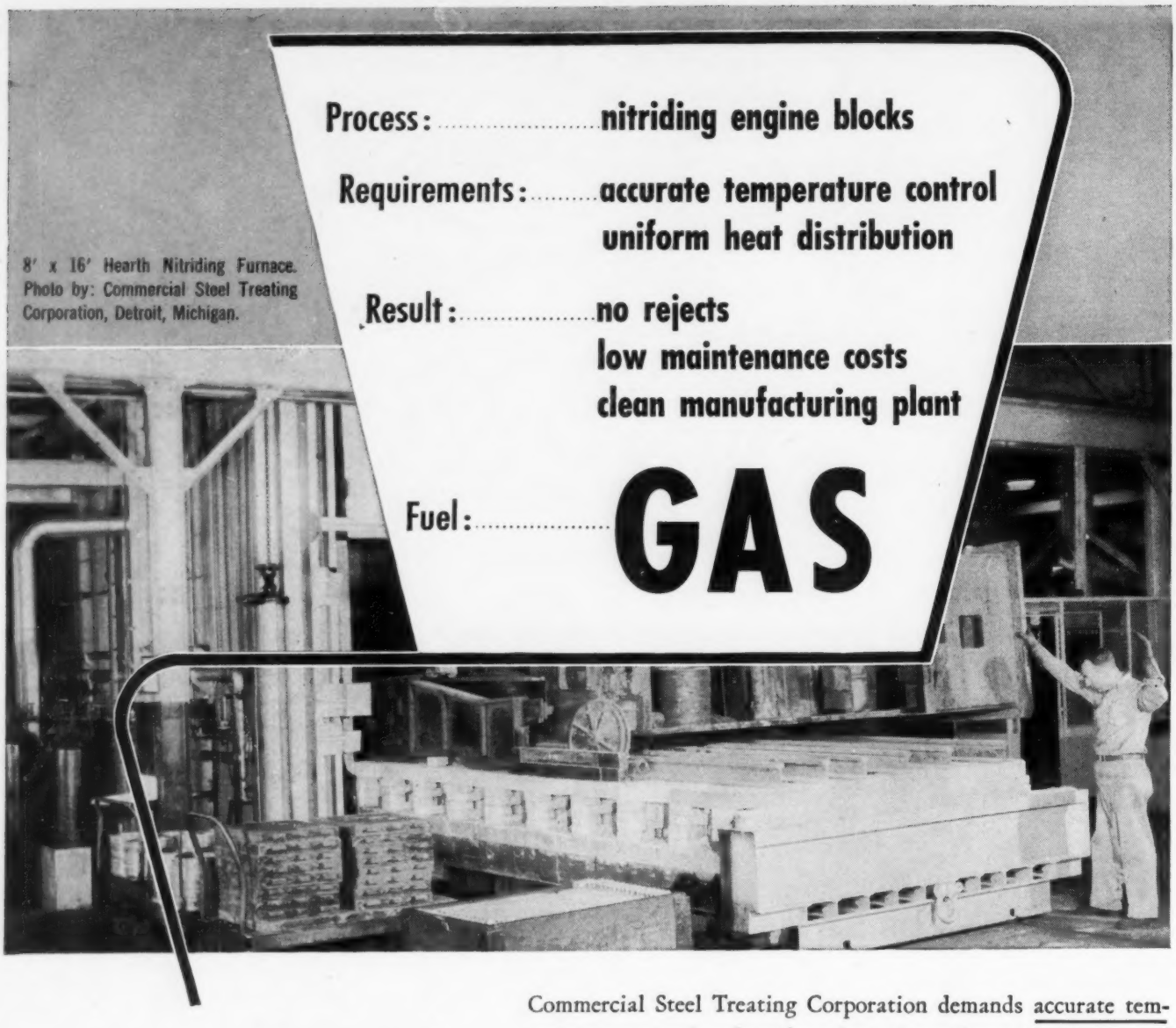
But the story doesn't end there—for right along with the "Greenfield" taps, dies and gages goes "Greenfield" service. Just as in America, "Greenfield" abroad supplies customers with the tools for every threading need and the experienced assistance of its field representatives. Sixty years of competition in far off places with other American manufacturers, as well as all types of foreign competition, is clear indication of sustained progress under the most trying conditions a business can face.

GTD Greenfield 75th YEAR

"Greenfield's" unique packaging system is an added convenience to distributor and buyer alike. Each type of tap is packed in a distinctive colored package, no two of which can be mistaken for one another. This saves time in picking out tools from stock and is valuable in helping customers' new employees quickly select the right tap for the order.

GREENFIELD TAP and DIE CORPORATION
Greenfield · Massachusetts

The GEOMETRIC TOOL COMPANY
New Haven, Connecticut · In Its Fifty-Fourth Year
A DIVISION OF GREENFIELD TAP and DIE CORPORATION



8' x 16' Hearth Nitriding Furnace. Photo by: Commercial Steel Treating Corporation, Detroit, Michigan.

Process: ..... **nitriding engine blocks**

Requirements: ..... **accurate temperature control**
uniform heat distribution

Result: ..... **no rejects**
low maintenance costs
clean manufacturing plant

Fuel: ..... **GAS**

Capacity and product specifications for the GAS-fired furnace include:

- **Temperature** ..... **975 degrees F.**
- **Allowable Variation** ..... **±5 degrees F.**
- **Process Time** ..... **96 hours**
- **Case Depth** ..... **0.025 inches**
- **Atmosphere Supply** ..... **Ammonia**
- **Production Rate** ..... **200 Tons per Month**

Commercial Steel Treating Corporation demands accurate temperature control and uniform heat throughout the chamber of its heavy-duty nitriding furnace. GAS fulfills these requirements; five years of successful operation supply the proof.

GAS, dependable fuel for industrial processing operations, meets the most exacting control and heating requirements. Low maintenance costs and cleanliness characterize GAS-fired installations.

You will want to study facts and figures on the use of GAS in your construction or modernization planning. The Industrial Representative of your local Gas Company has a wealth of useful information. He's as near as your telephone; he knows the answers.

AMERICAN GAS ASSOCIATION
420 LEXINGTON AVENUE, NEW YORK 17, N.Y.

MORE AND MORE...

THE TREND IS TO GAS

FOR ALL INDUSTRIAL HEATING

sults in such rapid oxidation of the material in the path of the oxygen stream that a cut is made. Iron oxide is formed.

This oxidation of the iron produces additional heat which tends to help melt the material adjacent to the reaction zone. The blowpipe tip may be moved in any predetermined direction. A combination of oxidation, melting, and erosion removes the material in its path. With proper skill, a fairly precise cut can be made, with relatively narrow kerf which cuts down the waste of material. Only the ferrous metals may be cut in this manner.

As in welding, various types of machines are used to carry and guide the blowpipe so that accurate and high-quality cuts may be obtained. These cutting machines may be small portable devices electrically driven, or large machines guided by remote control. A machine may cut straight lines, circles, or irregular shapes. Single pieces may be cut or many parts simultaneously, depending on the setup. Such machines are used extensively in shipyards and steel fabricating shops for cutting plates to the desired shape and for squaring and beveling plates prior to welding.

Shape-cutting machines have been developed and are in constant use for cutting plate or sheet to any desired shape. After the operator adjusts the flames, he follows a pattern on a drawing or templet. Through a pantograph or similar arrangement, the blowpipes follow the same pattern at the point of application. Single pieces or several pieces of the same shape may be cut from a steel plate at the same time. Plates up to 24 inches in thickness have been shape-cut, and steel up to 5 feet in thickness has been cut in straight-line work.

The accuracy obtained is surprisingly good and minimizes the final amount of machining. When parts are cut from thin plate, production can be increased by stacking a number of plates together and making a single cut or several cuts through the stack as if through a solid material. Such stack cutting has made practical the cutting of quite light material and has tremendously increased the capacity of shape-cutting machines as well as lowering unit costs.

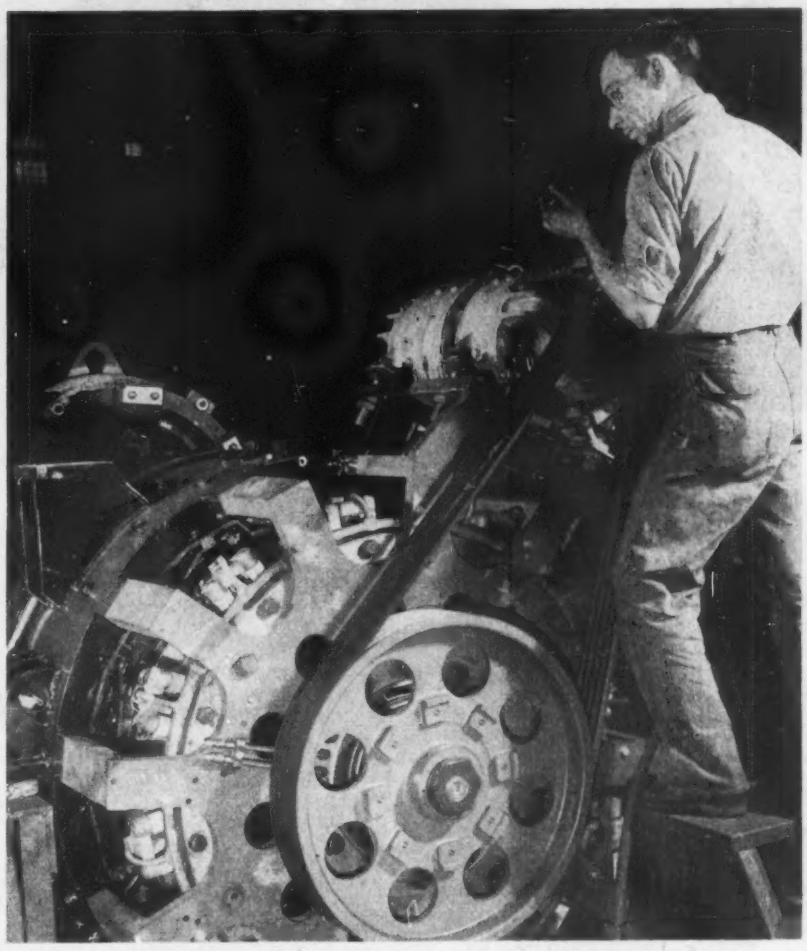
Cast iron may be cut by the usual hand blowpipe with a slightly different technique. The cut is not as precise as in steel; the kerf is wider.

High-alloy steels of the stainless variety are difficult and sometimes impossible to process by normal oxyacetylene cutting methods. High-chromium steel presents the greatest problem as it has a high affinity for oxygen at elevated temperatures and immediately forms highly refractory chromium oxide on the faces of the kerf. Heavy preheating and oversize nozzles can cut these steels with special manipulation.

An improvement was made by hand-feeding an iron rod or wire into the reaction zone or by using a waster plate of ordinary steel on top of the stainless steel. Another method has been the actual melting away of stainless steel. This process is very slow, especially on large sections, and does not give a precise cut suitable for further fabrication. Recently these steels have been satisfactorily and economically cut by feeding certain powder materials, largely iron, into the oxygen stream.

Flame-gouging is a process slightly different from conventional cutting in that a groove is cut instead of a cut completely through the metal. This depends on clever nozzle design and a relatively large jet of oxygen with proper controls and manipulations. This method is used for preparing plate edges for welding, for making grooves in steel plate, for removing temporary welds, and for preparing cracks in steel castings for later reclamation by welding.

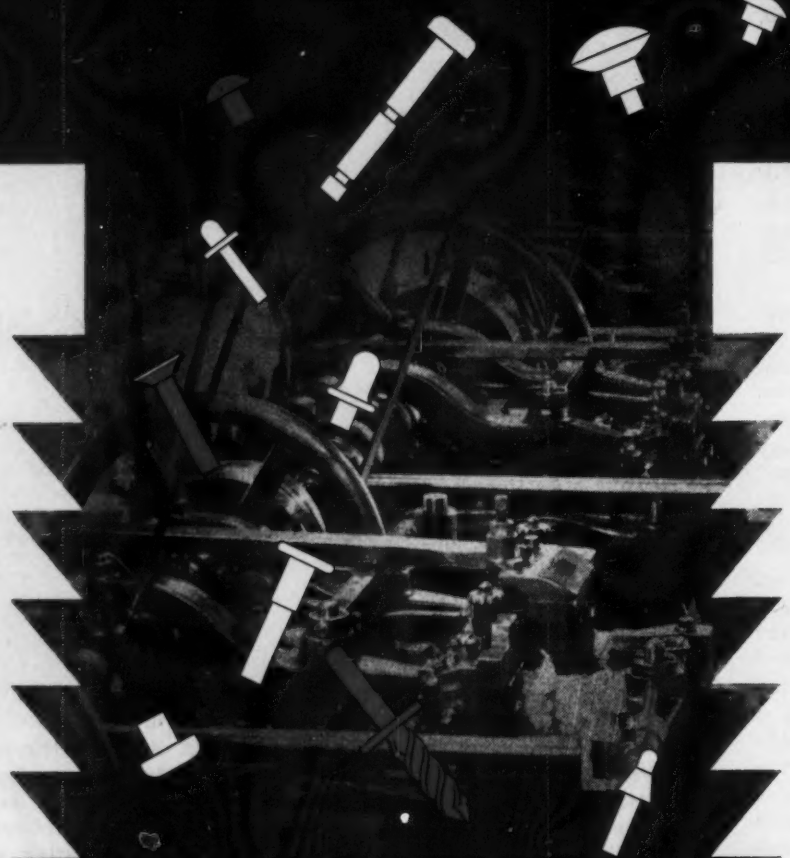
One of the most significant changes in modern steel-mill operations was brought about by oxyacetylene conditioning. This process, quite similar to gouging, removes surface defects in steel during its manufacture. It is variously known as deseaming, scarfing, or conditioning. Generally, however, the term "deseaming" (the removal of seams or cracks) is used when the operation is performed with a hand blowpipe. In mechanized steel conditioning, the entire surface of the billet, bloom, or slab, is removed by a conditioning machine set in the rolling mill line.



FOR RAILROAD DIESELS: Two or more of these 1500 hp electric generators are operated together in modern diesel-electric locomotives; five are used in the latest type to get 7500 hp. An employee of East Pittsburgh, Pa., works of Westinghouse Electric Corp., is seen here completing assembly of the exciter, to which is direct-connected an auxiliary generator that furnishes power for ventilating fans, water pumps, lights and other equipment. Pedestal on left side of generator frame is for engine supercharger

From data presented before 47th annual convention, International Acetylene Association at Cincinnati.

Cold-Headed Specialties

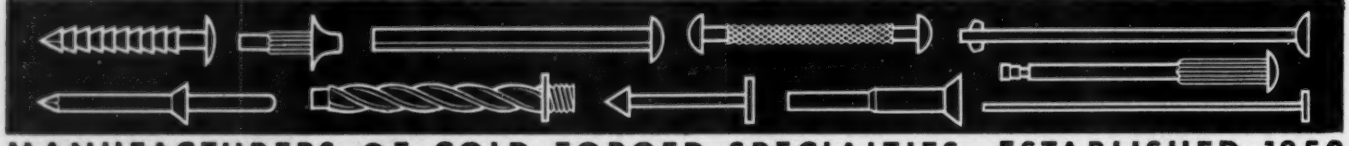


HASSALL cold-heading may solve your immediate special part problem . . . Special nails, rivets, and threaded parts made in diameters from 1/32" to 3/8" —lengths up to 6" . . . Rivets 3/32" diameter and smaller a specialty . . . Variety of metals, finishes and secondary operations . . . Economy, quality and quick delivery in large or small quantities . . . Tell us what you need . . . We will answer promptly. ASK FOR FREE CATALOG. 3-color Decimal Equivalents Wall Chart free on request.

SPECIAL NAILS·RIVETS·SCREWS
SPECIAL NAILS·RIVETS·SCREWS
SPECIAL NAILS·RIVETS·SCREWS

Hassall

JOHN HASSALL, INC. • OAKLAND AND CLAY STS., BROOKLYN 22, N. Y.



MANUFACTURERS OF COLD-FORGED SPECIALTIES—ESTABLISHED 1850

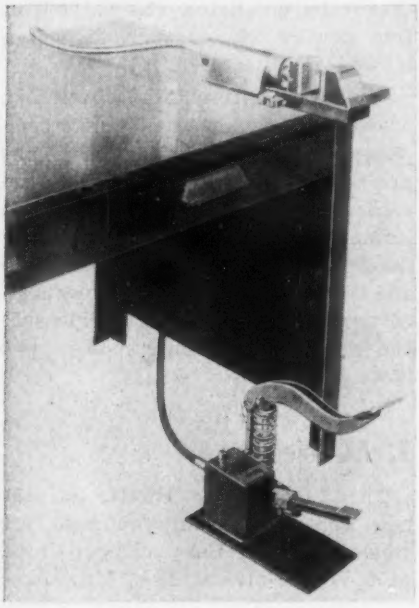
New Products and Equipment

Additional information on the new products and equipment described on this and succeeding pages may be obtained, without obligation, by checking appropriate numbers on the cards following page 164

1. Hydraulic Vise

Designed to increase production by allowing the operator to keep both hands on the job, the 2-ton hydraulic vise, announced by Munton Mfg. Co., Franklin Park, Ill., uses two foot pedals, one to tighten jaws, the other to release them. Built for strength and portability, vise has an overall height of 3 inches, a jaw depth of 2 inches, maximum jaw opening 2½-inches and overall length of 15 inches.

Features include: All steel welded construction; all steel hydraulically



operated foot control unit; and a long base for rigidity. It has slotted lugs for milling machine, drill press or bench. A block or stop of any size may be inserted in back of movable jaws to control opening.

2. Tachometer Indicator

Flush mounting on switchboards is possible with the new tachometer indicator added to the line of Metron Instrument Co., 432 Lincoln Street, Denver 9. Total projection is only 3/4-inch from the panel surface. Panel dimensions are 7 1/2 x 9 3/4-in. with a projection of 4 5/8-inches behind the front surface.

Indicator is supplied in any one of 50 standard scales covering speeds from 1 to 100,000 revolutions per minute. Multiple range features may be incorporated. It may be used with any one of the Metron tachometer heads for hand or fixed engagement for speed measurement. Incorporation of a rotary selector switch may be made to permit a single indicator to monitor speeds of several machines from a centralized location through a number of heads.

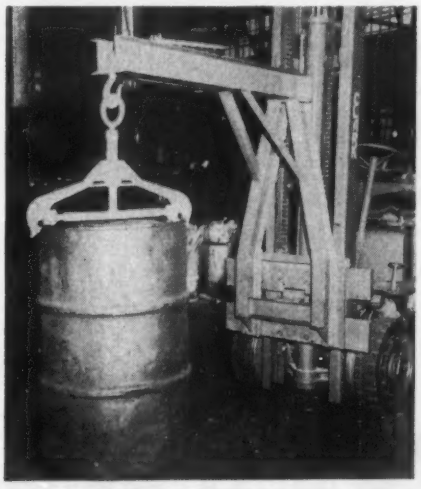
3. Materials Handling Box

Constructed with an all welded angle iron frame and ¼-inch, 5-pound mesh siding, the new materials handling box manufactured by United Steel Fabricators Inc., 1855 Turner avenue, N. W., Grand Rapids 4, Mich., has a rated carrying capacity of 8000 pounds. Called the Econo-Box, it is optionally available with a corrugated steel bottom, and has a 4-inch underclearance for fork lift trucks and guides on upper corners to assure straight stacking.

Mesh siding allows air to circulate through the box for better ventilation and parts cooling. Contents of box may be identified through the mesh when they are stacked for storage. In foundry applications, sand loss is minimized as it drains through the mesh of the 20 x 36 x 48-in. box.

4. Drum Handler

Safe handling of drums which must be moved singly or in the upright position to prevent spilling is possible with the new clamping device developed by Clark Tructractor Di-

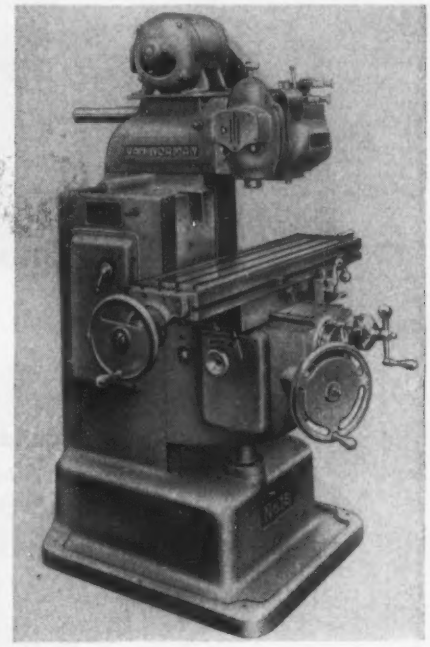


vision of Clark Equipment Co., Battle Creek, Mich., for any of their fork truck models. Clamp is self-adjusting for diameters from 21½ to 24 inches and employs a star cam permitting operator to release drum without dismounting.

Clamping over the chime, the device grips securely throughout transportation and carries up to 700 pounds. The attachment may also be used on fork trucks equipped with crane, swinging boom or special fork extension attachments.

5. Milling Machine

An adjustable cutter head and movable ram which permits horizontal, vertical and angular milling with standard milling cutters and conventional milling practices are features of the No. 16 ram type milling ma-



chine produced by Van Norman Co., Springfield, Mass. Applicable for use in various types of shops, the new machine reduces idle machine and operator time as most work may be carried through to completion without change in setup.

With built-in controls mounted on left side of column, the spindle, feed and coolant or any combination of these, may be started by moving one lever. A switch which is located on front of knee permits "start-stop" operations without going around to the side controls. Power feed is provided for table longitudinal travel. Table and spindle speeds are controlled by

quick change levers which provide for nine feeds ranging from 0.6 to 16 inches per minute.

The machine's nine spindle speeds from 95 to 2000 revolutions per minute are selected by two levers.

6. Area Meter

Consisting of a specially designed telemetering transmitter connected to a standard electronic receiver, a new electronically operated area meter developed by Bailey Meter Co., 1050 Ivanhoe road, Cleveland 10, is installed in a pipe line, much like a valve.

The unit will accurately measure the more viscous liquids, such as tar, chemicals, distillates, etc. as well as free flowing liquids such as water, oil and gasoline.

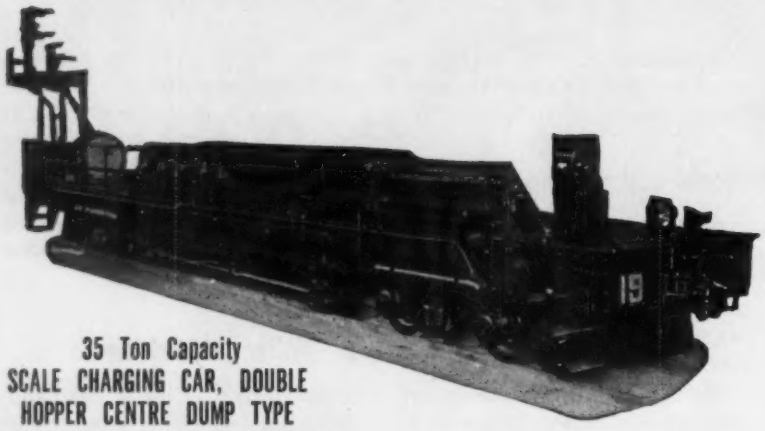
Advantages from its installation are that its packaged electronic components need not be balanced and are not affected by vibration, the recorder may be calibrated to read in terms of volumetric units thereby reducing errors due to density changes and two transmitters may be connected to the same recorder to measure the ratio, sum or difference of two flows.

7. AC Welders

The Dial-Electric control on the new line of alternating current arc welders built by Harnischfeger Corp., 4400 West National Ave., Milwaukee

14, Wis., eliminates the need for moving parts in the unit. Current selection is made by turning a single dial which requires but a ¾ turn

ATLAS
SCALE CHARGING CARS



35 Ton Capacity
SCALE CHARGING CAR, DOUBLE HOPPER CENTRE DUMP TYPE

Equipped with Atlas Indicating and Recording Dial. Car is provided with extra-heavy all steel roller suspension scales having removable knife edges. Also equipped with centralized lubricating system.

20 Ton Capacity
BOTTOM DUMP SCALE CAR

For use with roller bin gates. Equipped with Atlas underslung roller suspension scales and Atlas Indicating & Recording Dial.

Builders of:

DIESEL ELECTRIC AND STORAGE BATTERY LOCOMOTIVES FOR INTRAPLANT HAULAGE

SCALE CHARGING CARS AND ORE TRANSFERS FOR BLAST FURNACE STEEL PLANTS

COAL CHARGING CARS, CLAY CARRIERS DOOR EXTRACTORS, COKE GUIDES AND COKE QUENCHING CARS FOR BY PRODUCT COKE PLANTS

TURNTABLES

INDICATING AND RECORDING DIALS FOR WEIGHING SCALES

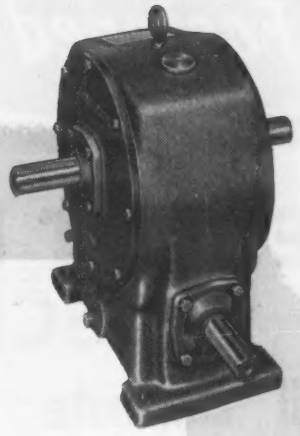
The ATLAS CAR & MFG. CO.

ENGINEERS MANUFACTURERS

1100 IVANHOE RD. CLEVELAND 10, OHIO, U. S. A.

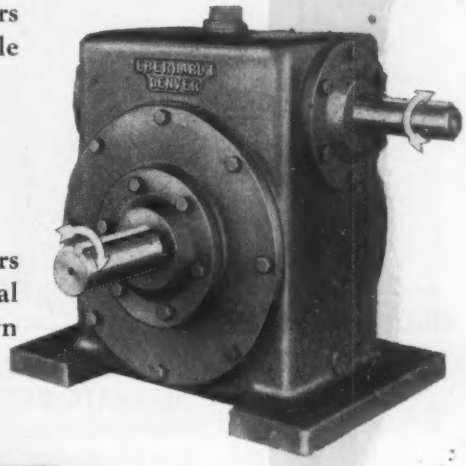
IN STOCK FOR PROMPT DELIVERY

COMPLETE LINE Eberhardt-Denver WORM GEAR SPEED REDUCERS...



STANDARD ON-THE-SHELF LINE

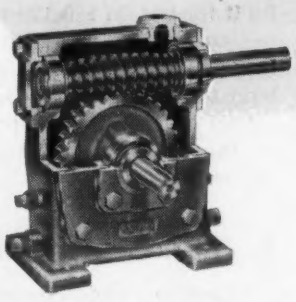
On many of your gear reduction applications you can take advantage of this standard line of small worm gear speed reducers . . . and save the time and expense of making special reduction units. These "In Stock" reducers are available in 29 models, single and double reduction, horizontal and vertical.



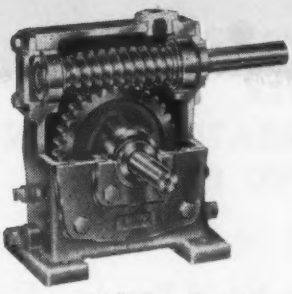
STANDARD OR CUSTOM BUILT HEAVY DUTY REDUCERS

A standard line of 12 heavy duty reducers are available for prompt shipment, or special reduction units will be built to your own specifications.

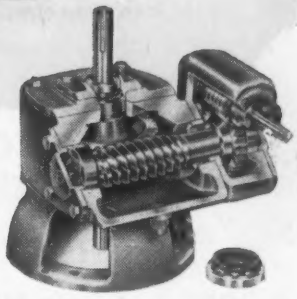
QUALITY REDUCERS



Worm and shaft are integral . . . worm is hardened, ground and polished.



Worm gear is made of high grade gear bronze with generated teeth.



Worm and gear shaft are carried on Timken tapered roller bearings.

QUALITY GEARS FOR 20 YEARS

Eberhardt-Denver Co.

1408 WEST COLFAX
DENVER, COLORADO

USE THIS COUPON

Gentlemen: Please send me your worm gear Speed Reducer Catalog and advise name of your distributor in this territory.

Name_____

Title_____

Company_____

St. or P. O. Address_____

City_____ State_____

S 113

Are Your Assemblies Fastened with Screws?

DETROIT POWER SCREWDRIVERS

Will Eliminate Assembly Bottlenecks

Most Efficient Feeding Hopper Designed

MOTORIZED BARREL TYPE—CAN BE SOLD AS A SEPARATE UNIT Will feed screws, nuts, washers, pins and special parts adaptable to hopper. These hoppers can be used on hydraulic or crank presses, riveting machines and special machines. Bracket designed for mounting at any angle. Four sizes: 10, 12, 16 and 24 inch diameters.

DETROIT POWER SCREWDRIVERS BRING YOU GREATER EFFICIENCY, SPEED AND ECONOMY

There's a Size to Fit Your Needs

MODEL A drives No. 2 to No. 6 Screws
MODEL B drives No. 6 to ¼" Screws
MODEL C drives ¼" to ⅝" dia. Screws.

All machines equipped with magazine feed hopper shown above, to feed all types of screws—standard and special heads, Phillips heads, and slotless heads. Driving time 1 to 2 seconds per screw. Uniform tension. No marring of heads. No stripping of threads. Screws are always in sight of the operator.

Send sample assemblies with screws for production estimates and prices on proper equipment for job.

DETROIT POWER SCREWDRIVER CO.

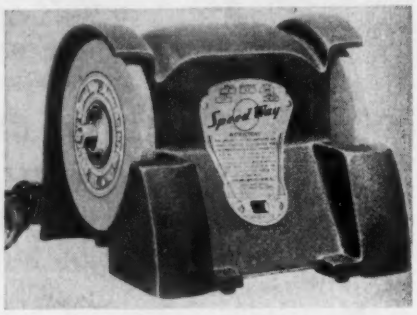
2811 W. Fort Street
DETROIT 16, MICH.

to cover the full welding range of the machine.

All industrial models of this series are designed for remote control. This feature is made possible by a removable control dial which provides a current amperage adjustment at the job for manual or automatic welding. Indicated on the control dial are two separate ranges, a high for general purpose welding and another for light gage welding. Welders are offered in intermittent industrial and heavy duty models, ranging up to 625 amperes.

8. Bench Grinder

Speedway Mfg. Co., 1834 South 52nd Ave., Cicero 50, Ill., is producing a portable bench grinder weighing 7 1/2 pounds with its 1-piece cast aluminum case which houses motor, shaft and bearings and provides integral wheel guards and tool rests. It operates at a speed of 3400 revolutions per minute, powered by a 1/15 horsepower intermittent duty motor of alternating current shaded pole type.



Grinder is equipped with rubber feet but may be bolted to the bench top. Built for use on 110-120 volt alternating current, it is supplied with one coarse and one fine grinding wheel, built-in thumb switch and a 6 foot rubber covered cord. Grinding wheels of the unit measure 4½ x ⅜ x ⅜ inches.

9. Plastic Mold Machines

Injection and compression type plastics molding machines are being manufactured in several capacities by Hydraulic Press Mfg. Co., Mt. Gilead, O. In the injection field, the newest machines are of 4, 6, 19 and 32-ounce capacities, all horizontal acting four-strain-rod type hydraulic mold clamps equipped with automatic material feeding, plasticizing and injection units.

Mold clamp consists of a double acting main ram fitted with metallic piston rings, working with a single acting booster ram in a smooth bored

When the Hegler Zinc Company, Danville, Illinois, purchased this 10-ton gasoline-powered Plymouth Locomotive back in 1920, it was to be used for hauling zinc slabs, zinc ore, and oxide sulphur to various departments. For more than 27 years it's been doing that job dependably and economically.

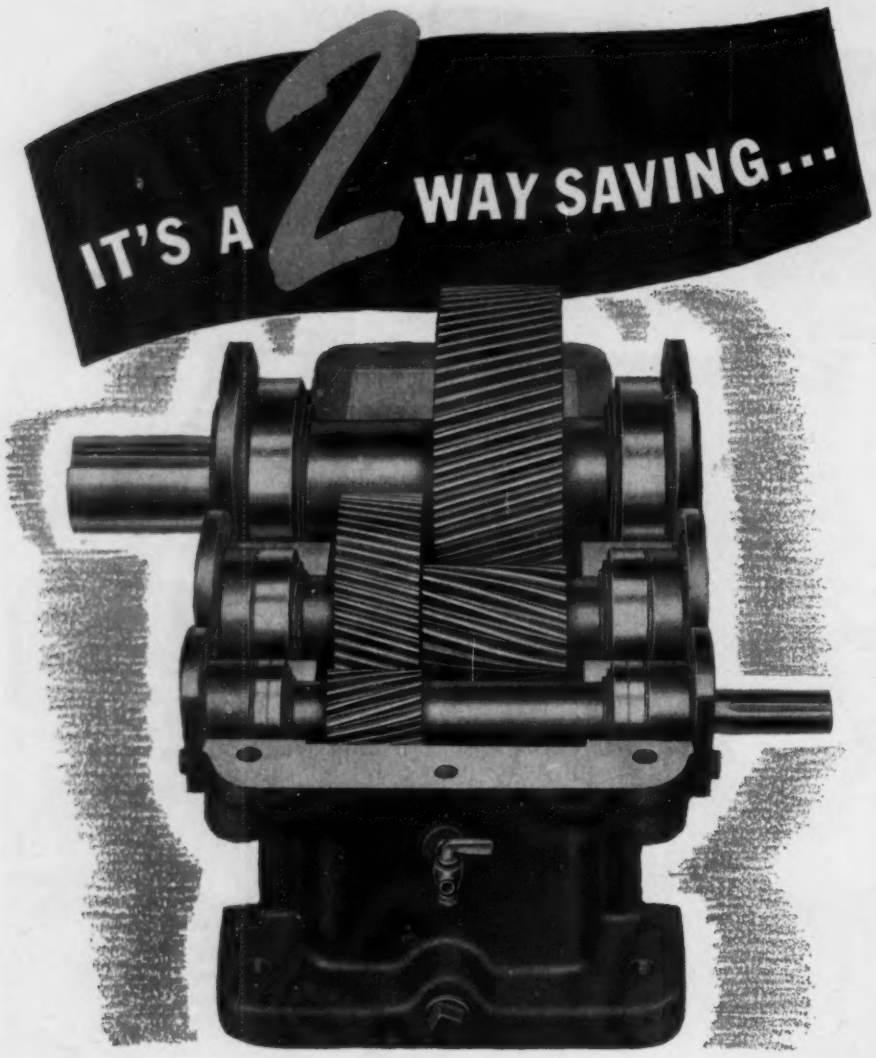
This outstanding performance record is the reason why The Hegler Zinc Company added another Plymouth to its "big, little railroad." And it's the reason why you can look with assurance to Plymouth for the answer to your industrial transportation problem.

Compact and powerful, Plymouth Locomotives provide economical and dependable haulage. Whatever your requirements, gasoline, diesel mechanical, diesel electric . . . standard or narrow gauge . . . there's a Plymouth Locomotive ready to do a real job for you. For full details write Plymouth Locomotive Works, Dept. A-1, Plymouth, Ohio.

PLYMOUTH LOCOMOTIVES

GASOLINE, DIESEL MECHANICAL AND DIESEL ELECTRIC

PLYMOUTH LOCOMOTIVE WORKS • Division of The Fate-Root-Heath Co., Plymouth, Ohio, U.S.A.



Here's Why You Can Save Money on Horsburgh & Scott Helical Speed Reducers . . .

1. Lower cost in manufacture and assembly by engineered simplicity of design.

2. Savings in maintenance and freedom from breakdowns through rugged construction from the finest materials and precision manufacture.

These features are your guarantee of better built speed reducers that last longer.

Send now on Company Letterhead for Speed Reducer Catalog 46

THE HORSBURGH & SCOTT CO.

GEARS AND SPEED REDUCERS

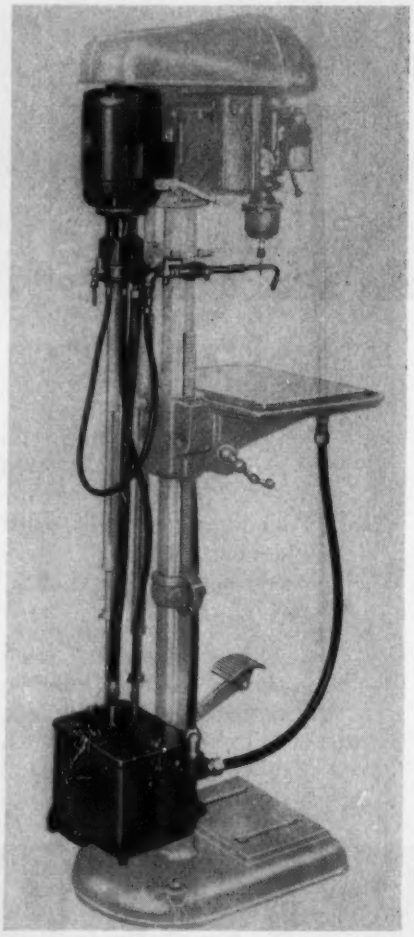
5112 HAMILTON AVENUE • CLEVELAND 14, OHIO, U. S. A.

cylinder. Sprue bushing half of die is mounted on a movable die head that is backed by a stationary V-shaped die head to give easy access to nozzle and heating chamber.

Five injection machines manufactured consist of 125 to 750-ton mold clamps. Machines of 50, 100, 200 and 300-ton capacities include heads drilled and tapped to take standard transfer cylinders for transfer molding. They are vertical, upward acting open rod machines, with a separately housed power unit located to the right of the press proper. All are arranged for semiautomatic control, multiflex timer providing automatic timing of each portion of the press cycle.

10. Tapping Machines

A continuous flow lubricating pump is a feature of the new series of universal tapping machines produced by Procunier Safety Chuck Co., 18 South Clinton St., Chicago 6, Ill. This "Hi-Boy" lubricating pump is of the motor driven gear type and provides a continuous flow

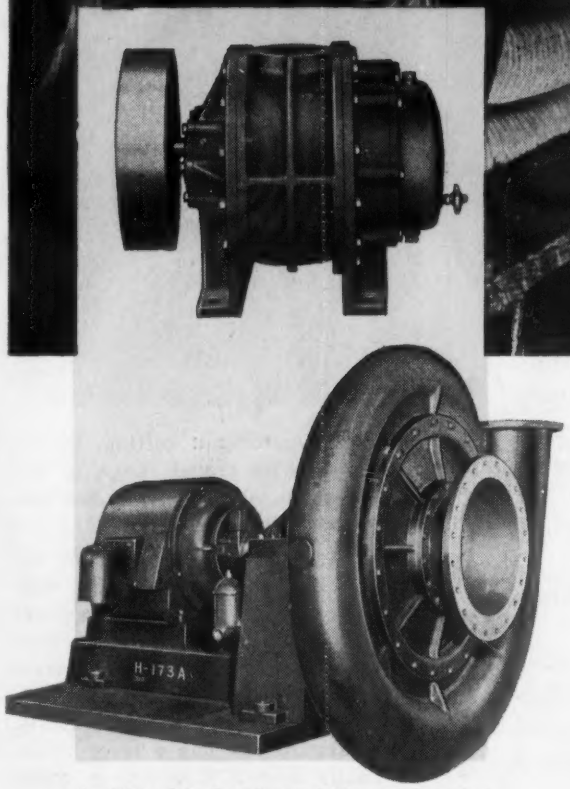


of lubricant to the tap, even while "backing out." Continuous flow aids in making deeper cuts and in tapping tougher metals.

Tap driving and reversing pres-

AIR GOES TO WORK FOR SAFER MINING

(Photograph by courtesy of Bituminous Coal Institute)



In 1858, when the Atlantic Cable carried its first message, "Roots" had been producing blowers for four years, since 1854. We're not good because we're old, but old because we're good!

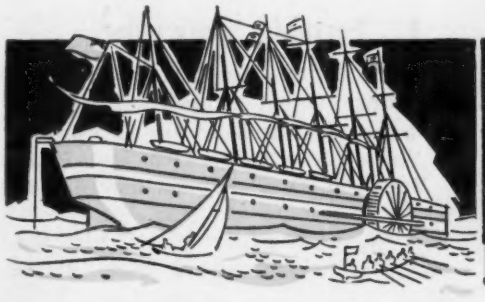
Coal dust in mines is an old hazard problem. Modern practice minimizes danger by blowing rock dust onto walls and roofs, diluting the coal dust and safeguarding against explosions.

The installation pictured uses reliable Roots-Connersville *Rotary Positive* Blowers. These compact, sturdy units have a capacity for long, hard work that especially suits them to such unfavorable conditions.

For many applications, the advanced designs of R-C *Centrifugal* Blowers are more advantageous. Whatever the work to be done, our *dual-ability* to design and build both types enables us to recommend the *right* blower for the specific job.

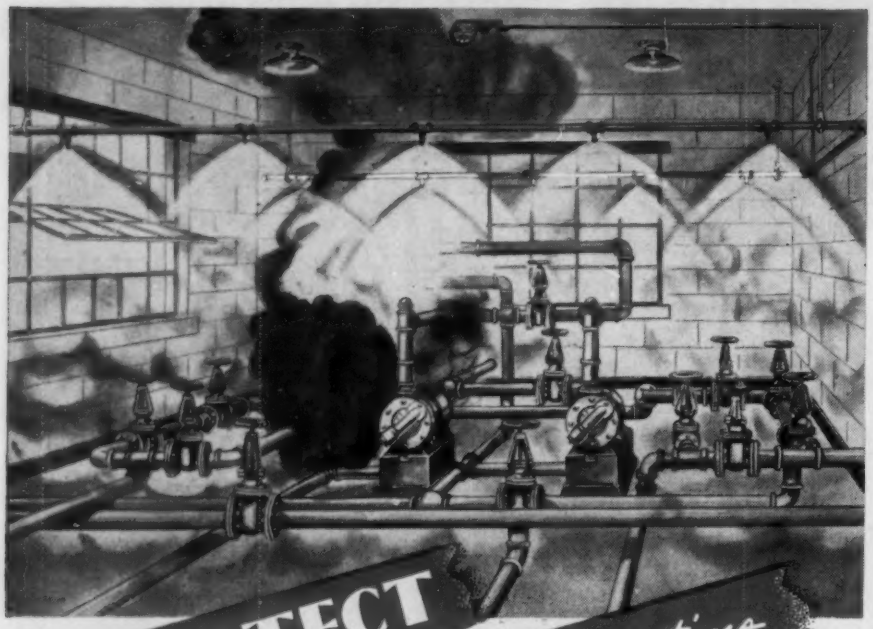
So, if you have a problem of handling gas or air in any quantity, ask R-C *dual-ability* to help solve it.

ROOTS-CONNERSVILLE BLOWER CORPORATION
711 Steelton Avenue, Connersville, Indiana



ROOTS-CONNERSVILLE
ROTARY CENTRIFUGAL
BLOWER BUILDERS · R-C · SINCE 1854
BLOWERS · EXHAUSTERS · BOOSTERS · LIQUID AND VACUUM PUMPS · METERS · INERT GAS GENERATORS

★ ★ ONE OF THE DRESSER INDUSTRIES ★ ★



The resultant damage from a fire in this pumping station must be calculated, not only in terms of actual physical loss but also in terms of losses resulting from the interruption to plant operations.

Whether started from a cracked fitting, faulty pump packing, leaky flange or similar cause—fires of this type have sent flames rocketing to alarming proportions and intensity within the space of a moment.

Matching the speed and ferocity of the fire, with the instant starting and control obtained, "Automatic" FIRE-FOG offers the modern effective means of combating this serious threat to plant operations.

There's no escaping FIRE-FOG's mist-fine water spray—it beats down the flames, drives out the oxygen, smothers the fire.

Automatic in operation and supersensitive to quick heat rises, FIRE-FOG is ideal for quenching fires of flammable liquid origin —positive protection for such areas as loading racks, valve pits, process building and areas, oil filled electrical equipment and similar hazards.

FIRE PROTECTION
DEVELOPMENT ENGINEERING
Automatic Sprinkler
MANUFACTURE INSTALLATION
"AUTOMATIC" SPRINKLER CORPORATION OF AMERICA
YOUNGSTOWN 1, OHIO
OFFICES IN PRINCIPAL CITIES OF NORTH and SOUTH AMERICA

sures are preset by long compensating springs which maintain proper pressure to tap, regardless of pressure on foot pedal. Machines are made in two sizes: Series A with a capacity from a No. 2 tap up to 5/16-inch in steel, ⅜-inch in cast iron and ½-inch in brass; and series D, with a capacity from a No. 10 tap up to ½-inch in steel, ⅝-inch in cast iron and ¾-inch in brass.

11. Air Screw Driver

Aro Equipment Corp., Bryan, O., is manufacturing two new air screw drivers, models 7037 and 7039, for attachment, using ¼-inch hex shank No. 4 to 8 wood or machine screws. Tools incorporate a friction clutch attachment, using ¼-inch hex shank bits or a ¼-inch hex adapter with

square drive for nut setting. Clutch permits greater travel range of the adjusting nut which controls the tension of the clutch spring.

To attain a required tension, nut is adjusted, and screws or nuts driven to the desired torque requirements. Angle of the friction jaws is such that the jaws will slip freely when the adjustment or tension is at a minimum or maximum. Model 7037 (illustrated) has a lever throttle, while model 7039 has a pistol grip. Speed is adjustable up to 1800 revolutions per minute.

12. Portable Spotwelder

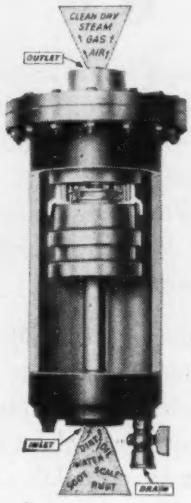
Usable wherever 220 volt alternating current is available, portable spotwelder made by Adams Portable Spotwelder, S. E. 17th and Boise, Portland, Ore., may be moved from job to job by one man. It is used on 16 to 22-gage material although lighter or heavier material may be

handled intermittently. Rated at 90 amperes, its transformer is sealed and insulated. Transformer case is provided with casters and handle.

Pistol-type spot welding gun furnishes adjustable pressure at welding joints. Shape of jaws may be changed to accommodate unusual types of jobs. A dial regulates the output of current. It may be operated in conjunction with an electronic timer. A push-type gun is available, permitting welding of large surfaces which cannot be reached with the pistol-type gun.

13. Air Separator

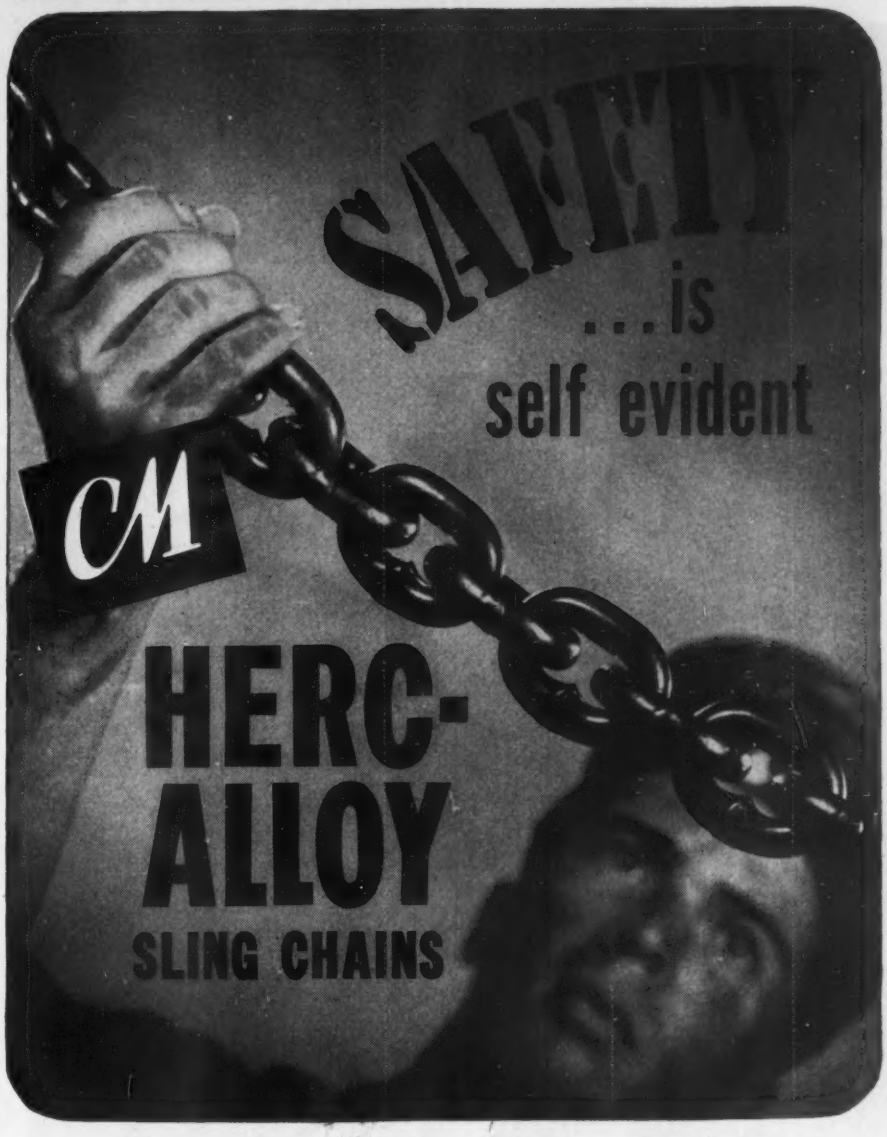
Clean, dry steam, gas and air may be delivered by the model E air separator, announced by Chicago Mfg. and Distributing Co., 1928 West 46th St., Chicago 9, Ill. Separator has no moving parts and no adjustments or regulations are necessary. Operation is mechanical and no attention is required other than draining off condensation that accumulates in the chamber. Maximum rated capacity is 250 cubic feet per minute. Dimensions are: Diameter, 8 inches; height, 15 inches; and pipe connection is a standard 1½-inches.



14. Sealed Switch

Micro Switch, Freeport, Ill., is manufacturing a new sealed precision switch with adjustable roller arm actuator for use in industrial equipment where exposure to dust, dirt abrasives and an occasional splash of oil and water is encountered. The type N2 die cast switch is designed particularly for cam and slide actuation. Roller arm actuator is adjustable both vertically and horizontally.

Synthetic rubber boot covering operating plunger and gasket as-



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- America's *first* alloy steel sling chain... first to bear a serial number.
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- Every chain is individually tested and accompanied by a certificate of registration.
- Links are side welded for maximum strength by patented INSWELL electric method.
- HERC-ALLOY Chains should *never* be annealed.
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● A simple visual inspection* is all that is needed to determine the continued serviceability of a HERC-ALLOY Chain. That's why more and more of the important companies are standardizing on HERC-ALLOY... because HERC-ALLOY Chains are immune to unseen dangerous crystallization... because you can *see* when a HERC-ALLOY Chain needs repairs or replacing.

Write for your copy of this new, informative booklet. No charge.

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CHAIN CORPORATION
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GENERAL OFFICES AND FACTORIES: TONAWANDA, N. Y.
SALES OFFICES: New York • Chicago • Cleveland • San Francisco • Los Angeles

"See us in Cleveland at Booth 526 . . . Materials Handling Exposition January 12-16"

sembled between bottom plate and house case provides a sealed unit when conduit hub is fitted with rigid conduit. Operating force is 6 to 16 ounces and release force is a minimum of 4 ounces.

15. Sealed Ball Bearings

Announced as an addition to the line of Plya-Seal ball bearings, products of Fafnir Bearing Co., New Britain, Conn., is a series designated as W-PP, incorporating a single row of balls, with seals on both sides for retention of lubricant and exclusion of foreign material. Use of single row of balls in double row width provides space for a longtime supply

of grease without total filling, thus permitting grease expansion due to aeration and agitation under high speeds, without leakage.

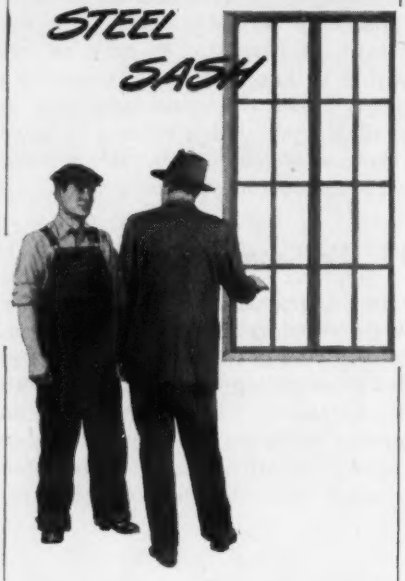
Three-piece Plya-Seals are used, each a synthetic rubber-impregnated sealing washer supported between two steel split retaining rings. Seal is impervious to grease and the common contaminants. Bearings are produced in bore sizes from 20 to 70 millimeters and in two series.

16. Surface Pyrometer

Completely self contained, portable and quick acting, the new Pyro surface pyrometer, manufactured by Pyrometer Instrument Co., 103 Lafayette street, New York 13, has interchangeable thermocouples and extension arms which make it suitable for any surface temperature measurements, either metallic or nonmetallic. Each instrument has an internal automatic cold end junction

FOR THE UTMOST IN RUST PREVENTION

HOT-DIP GALVANIZE STEEL SASH



Architects and Engineers, more and more, specify the use of protective zinc coatings for the *utmost protection* to metal components of all types of exposed structures.

The American Hot Dip Galvanizers Association have established and are pledged to follow the highest standards in Hot-Dip Job Galvanizing. They assure the highest quality of workmanship, the best in materials, and employ the newest and most modern methods.

The collective know-how of the entire membership is available to you through the member whose location can best serve you. For membership roster write the Secretary, American Hot Dip Galvanizers Association, First National Bank Building, Pittsburgh, Pa.

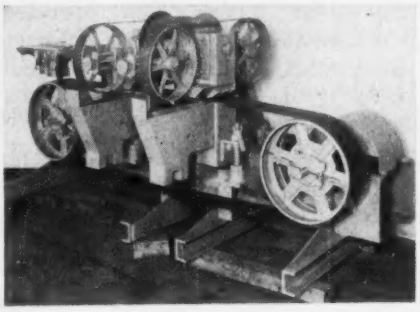
hot-dip GALVANIZING

compensator so that external temperatures have no effect on its reading.

In operation desired thermocouple is placed in locking connector without use of tools; contact is made with surface where reading is desired. Reading is taken on a 4-in. direct reading scale. Several types of thermocouples are offered. Five models with a temperature range of 0 to 300, 400, 600, 900 and 1200°F are available. Accuracy is to within plus or minus 2°F.

17. Magnetic Separator

Manufacture of a cross belt type magnetic separator for the concentration of feebly magnetic ores, removal of magnetic specks and iron oxides from chemicals, powders, etc., and for segregating of magnetic and nonmagnetic materials, is announced by Magnetic Engineering & Mfg. Co., Clifton, N. J. Known as the Memco-Wetherill type machine, it has a main



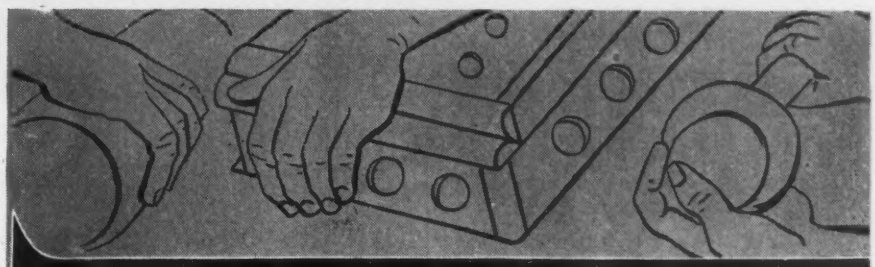
conveyor belt which may readily be changed without disturbing any other part of the separator.

Magnetic gap adjustments are simple to make. Adjustments are made by lowering and raising the power pole pieces and not disturbing the top magnet. Standard equipment includes multiple magnetic discharge hoppers, magnetic vibrating feeder, variable speed drive and control panel. Standard sizes range from a main conveyor belt 6 to 18 inches wide with from two to ten cross belts.

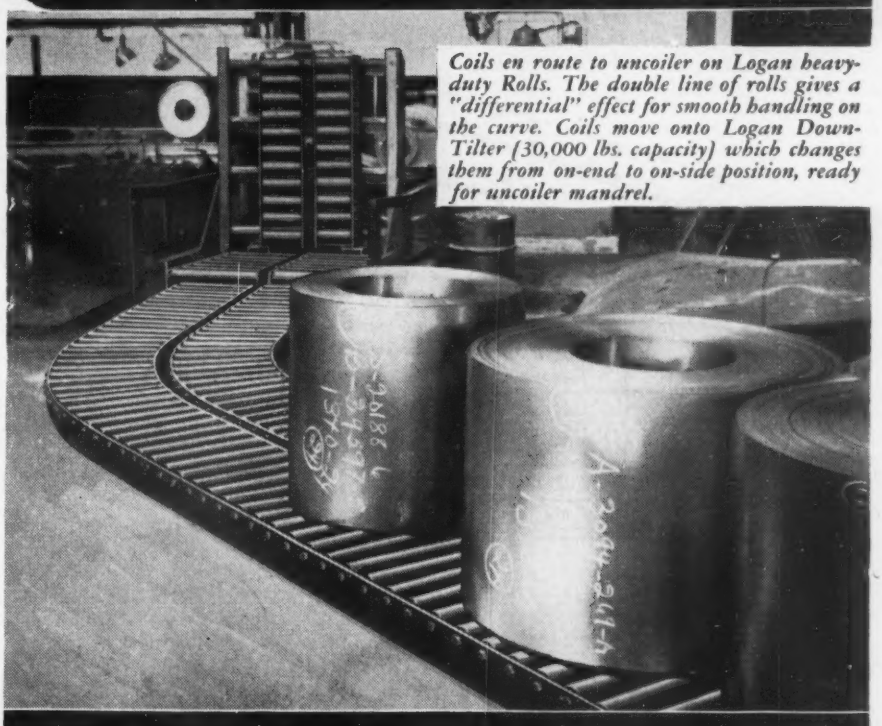
18. Electric Furnace

Suitable for heat treating of small parts, tools and dies, an electric furnace, made by Cooley Electric Mfg. Corp., Indianapolis, Ind., is capable of continuous operation at 2000°F and provides accurate temperature control down to 300°F. Designated as model VK-5, the furnace heats from cold to 2000°F in 1½ hours.

Rapid and uniform heating of the 8 x 6 x 14 inch chamber is assured by six embedded heating elements, including one in the door. Power ca-



LEAST HANDLED..



Coils en route to uncoiler on Logan heavy-duty Rolls. The double line of rolls gives a "differential" effect for smooth handling on the curve. Coils move onto Logan Down-Tilter (30,000 lbs. capacity) which changes them from on-end to on-side position, ready for uncoiler mandrel.

IS BEST HANDLED

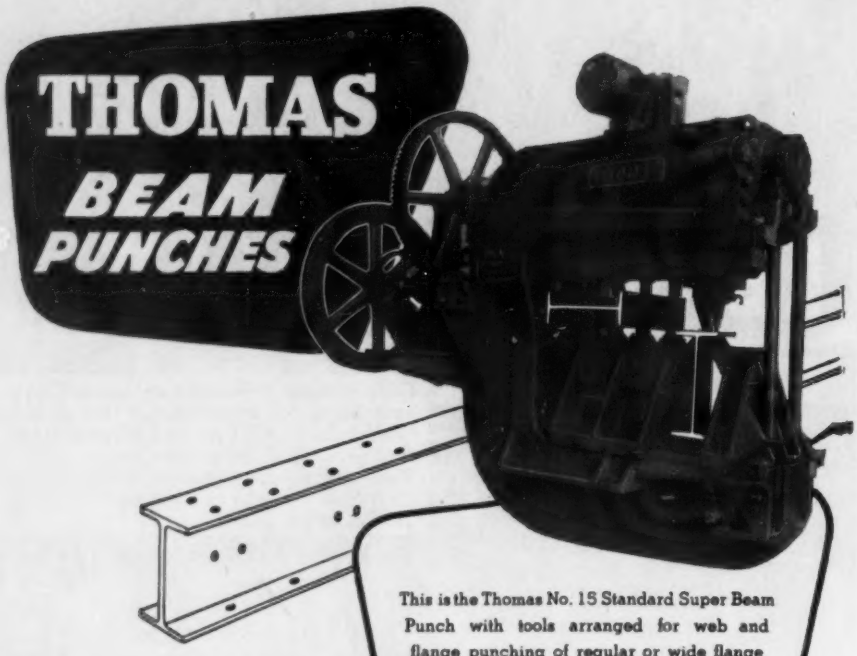
Any way you take it . . . manual handling costs money. Logan conveyors, designed to mechanize almost every possible handling operation, can eliminate or greatly reduce this heavy drain on costs.

And in addition to that, Logan equipment permits the application of workers' time and energy to tasks more productive . . . duties which require the "human touch."

That's why mill and factory engineers are replacing costly "pick-ups" and "lay-downs" with the economical "flow" of Logan conveyors wherever possible. Under competitive conditions conveyors often can make the difference between profit and loss.

Logan Conveyors

LOGAN CO., INC., 535 CABEL ST., LOUISVILLE 6, KY.



This is the Thomas No. 15 Standard Super Beam Punch with tools arranged for web and flange punching of regular or wide flange sections up to 36 inches. The Thomas line comprises various models, all with flexible tool arrangements.

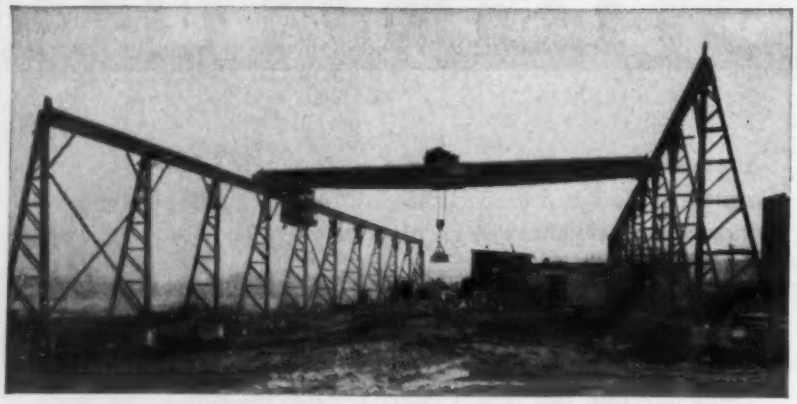
Write for Bulletin 304

THOMAS
MACHINE MANUFACTURING COMPANY
PITTSBURGH, 23, PA.

10

BEDFORD CRANES

CRANE BUILDERS Since 1903



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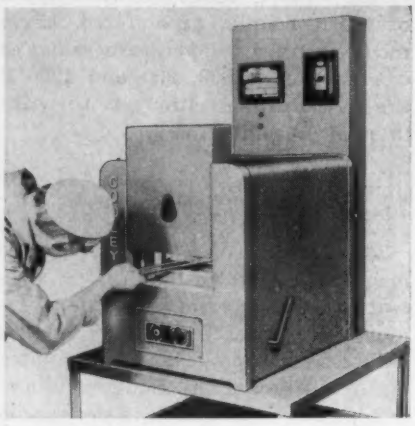
BEDFORD FOUNDRY & MACHINE CO.
BEDFORD, INDIANA, U. S. A.

Engineers Designers Fabricators

pacity is 4650 watts. Only 2½ kilowatts are required to maintain the maximum temperature. Furnace is equipped with a selective power modifier which, as used with an indicating-controlling pyrometer, permits meeting critical temperature require-



ments. Power input may be adjusted to balance furnace heat losses. Modifier unit consists of a synchronous motor driven, cam operated switch which may be set to maintain power from 5 to 100 per cent of capacity, a dial control, relay and pilot light.

19. Miniature DC Motor

Operated from a small amplifier tube, flashlight type battery or similar source, a miniature, permanent magnet motor has been developed by Essell Corp., 19 Euclid avenue, Newark 5, N. J., for applications where a minimum input is of primary importance. Magnet and pole-shoes assembly is cast in as an integral part of the zinc die cast housing. Motor end covers are permanently sealed in to prevent tampering.

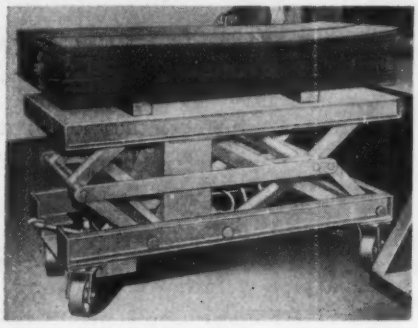
Winding of basic motor can be changed to operate over a considerable range of low voltages, although motor is designed for operation on 1½ v dc. Characteristics of motor at "no load" are 0.23 amp and 5300 rpm. At "load" characteristics are (1.5 oz at ⅛-in. radius) 1½ v dc, 0.8 amp, 3000 rpm, 0.0005 hp and 34 per cent efficiency.

20. Sheet Handling Table

Handling and feeding to presses and shears, loads of sheet metal up to 10,000 pounds, may be accomplished by means of the hydraulic, toggle-lever type of sheet feeding table, manufactured by Lyon-Raymond Corp., 3769 Madison St., Greene, N. Y. Stock may be loaded on the table by fork truck or overhead means

either in stockroom or at machine, the table being portable for transporting loads. Hydraulic elevation allows leveling of load with press bed.

Toggle-lever design gives full support to entire length of the table top. Lifting action is obtained by hydraulic pump through cylinders which operate laterally against the toggle-



lever mechanism. Table top measures 30 x 96 inches. Lowered height is 22 inches and elevated height is 34 inches. It normally has one set of 12-inch wheels and one set of 8-inch swivel casters but four swivel casters are available. Standard equipment includes floor lock and the two-speed pump. Motor driven pump and table extensions are optional.

21. Control Pilot

Diaphragm regulating valves may be controlled with the all-purpose pressure control pilot introduced by Leslie Co., 152 Delafield avenue, Lyndhurst, N. J. The pilot is a simple, positive mechanical device used to control valve action so as to maintain a constant controlled pressure. It may be used to regulate operating pressure (air, clean gas, water or light oil) to a standard diaphragm regulating valve in the flow line of the fluid to be controlled.

Economical operation is assured as there is no continuous leakage of operating pressure, this being important in stand-by applications. Pilot requires no attention over long operating periods and no recalibration during service. Nine controlled pressure ranges from ½ to 800 psi are manufactured.

22. Fractional HP Motor

Built in sizes from 1/25 to 1/100 horsepower, the improved 4-pole shaded pole motor, designated as type T Micromotor, is being manufactured by Redmond Co. Inc., Owosso, Mich. It has a three piece die cast frame with a steel outer shell enclosing the air-stream cooling system. In the

New Slant on Plating

A close investigation of your plating operations can show a reduction in finishing cost without jeopardizing the quality of the work. There is that possibility. Here's a thought along that line and an offer.

Udylite, using its modern technical facilities and trained staff, will make this investigation for you at no cost to you and in accordance with a plan that has proved to be very practicable.

First

a preliminary survey of your operations is made by one of Udylite's field engineers.

Then

a complete analysis including laboratory work is conducted by Udylite engineers and electrochemists at headquarters in Detroit.

Finally

a full written report which includes all findings and whatever recommendations may be justified is turned over to you. You may then take whatever action you choose. It does not obligate you.

Udylite *First in the Field of Metal Finishing*

THE UDYLITE CORPORATION

DETROIT 11, MICHIGAN

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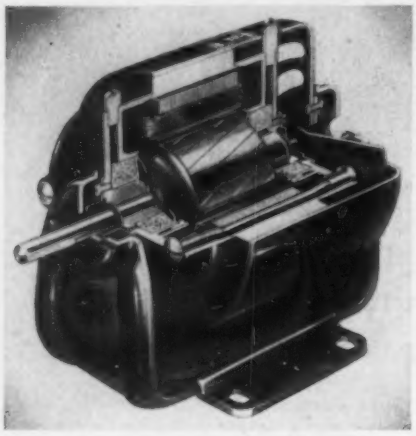
flush weld rotor, every slot is copper filled flush with the surface, precision skewed and welded. The surface is machined and rust inhibited.

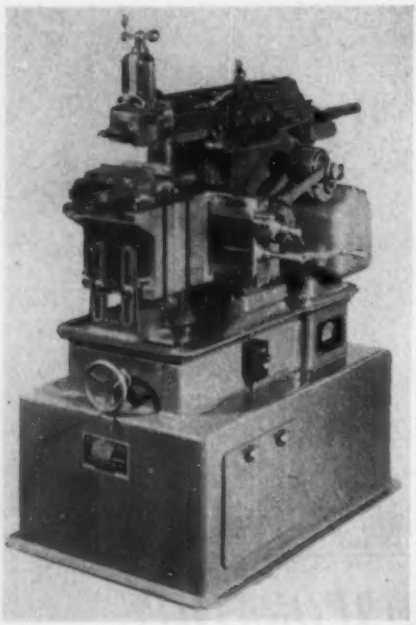
Windings are resistant to oil and atmospheric conditions. Porous bronze bearings are broadly spaced and each is individually fitted to the shaft at close tolerances and spring tension



centered. The porous bronze retards gumming by filtering the lubricant. Oil return to reservoirs is accomplished by oil slingers and retainers. Motor is cradled in live rubber cushions held in place by steel cups.

23. Shaper

Designed to fill the gap between the large, heavy industrial shapers and small bench type machines, the new 12-inch shaper, announced by Sheldon Machine Co. Inc., 4258 North Knox Ave., Chicago 41, Ill., will do all shaper work within its capacity. This Shel-



don-Vernon machine has within its streamlined pedestal a variable speed motor drive which provides all speeds from 12 to 180 strokes per minute at the turn of a hand wheel.

It has automatic cross feeds in both directions from 0.0025 to 0.0175-inch. Swivel table and swivel vise are standard equipment. All controls are within easy reach of operating position. Heavy cross rail, large dovetails, broad ways and extra overhand of the ram enable it to hold its accuracy.

DEVELOPED BY . . .

24. United Chromium Inc., 51 East 42nd St., New York 17, N. Y., Clear Dip, a simple chemical treatment for new zinc plate which produces a brilliant conversion coating. It will withstand 50 hours of salt spray exposure.

25. Electrol Inc., Kingston, N. Y., a selector valve usable in air, water, oil and gasoline systems. A poppet valve assures free operation and eliminates sticking. Built-in detents assure positive handle positions.

26. North American Philips Co. Inc., 100 East 42nd St., New York 17, N. Y., a multipurpose, self quenching Geiger tube for use with beta, gamma and soft x-ray radiation.

27. General Photo Products Co., 15 Summit Ave., Chatham, N. J., Tru-Copy-Phote machine for making reproductions of writing, drawings, photographs, etc. Bantam model has copying surface of 8½ x 11 inches.

28. Wall Colmonoy Corp., 19345 John Rd., Detroit 3, Mich., a plastic bonded rod for use with company's Spray-weld process. Metallizing gun flame burns out plastic, leaving metal overlay particles.

29. Westinghouse Electric Corp., Pittsburgh 30, Pa., an explosion tested direct current line starter. For use with motors up to 5 horsepower at various voltages, it has a magnetic contactor with knife edge bearings.

30. Power-Pak Products Inc., 43 Pearl St., Buffalo 2, N. Y., a small carbon dioxide fire extinguisher. Unit measures 1⅞ x 15 inches and has wall bracket.

31. Speco Inc., 3142 Superior Ave., Cleveland, O., Rustrem antirust paint, which may be applied over rust without brushing or scraping. It penetrates rust, renders it inactive and seals surface.

32. Sigma Instruments Inc., 70 Ceylon St., Boston 21, Mass., a 3-position null indicating polarized relay for control circuits and servomechanisms. Rating is 5 amperes, 110 volts alternating current.

33. General Electric Co., Schenectady 5, N. Y., a type W-94 welding electrode for hard surfacing applications where resistance to impact, wear and abrasion are required. It will harden to hardness of 50 rockwell C.

34. Barnaby Mfg. & Tool Co., 70 Knowlton St., Bridgeport 8, Conn., a line of rotary stock stops for automatics and turret lathes in eight sizes with either plain end or center hole for burr.

35. Porst Sales, 132 West Union St., Pasadena 1, Calif., the B & D internal pipe wrench which has sufficient strength to strip a thread without losing grip. The tool is offered in eight sizes from ½ to 6 inches.

36. Foxboro Co., Foxboro, Mass., a 12-inch slide rule for computing orifice plate bores, flow nozzles or venturi throats and rate of flow. Rule is usable for all fluids, with or without seals.

37. Automatic Control Co., 1005 University Ave., St. Paul 4, Minn., a L-200 two pole, double break snap back float switch with silver to silver contacts. Mechanism is housed in drip proof case.

38. Hobart Bros. Co., Hobart Square, Troy, O., a No. 12 electrode designed to increase welding speed on poor fit up work. Made in various sizes for straight polarity direct and alternate current.

39. Detroit Stamping Co., 359 Midland Ave., Detroit 3, Mich., model 640 Ram plunger clamp, capable of exerting over 2500 pounds pressure. It is adaptable to light arbor, punch and forming presses, etc.

40. Ampco Metal Inc., 1745 South 38th St., Milwaukee 4, Wis., a centrifugal pump of corrosion resisting aluminum bronze. Single stage, single section closed impeller models have capacities up to 240 gallons per minute.

FOR MORE INFORMATION
on the new products and equipment in this section, fill in a card. It will receive prompt attention.

Little Betterment Sighted In Steel Supply Conditions

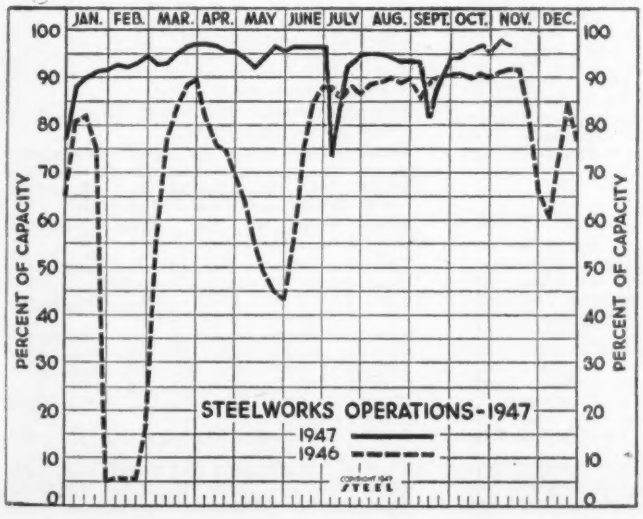
Producers expect substantial tonnage carryover in major products at yearend. Situation particularly acute in flat-rolled items. Scrap less turbulent but buying test is awaited. Slight bulge in steel price line noted. Reimposition of government controls opposed

PROSPECTS are dim for any substantial early easing in tight supply conditions in the major steel products. Despite accelerated production over recent months steelmakers have not been able to materially dent the huge order backlogs that have accumulated. Only here and there is a ray of betterment noted, and chances appear slim much headway will be possible over winter months in view of the precarious state of raw material supplies, chiefly scrap, which may force some curtailment in steel production.

Indicative of steel producers' efforts to meet consuming demands is the fact that in the first nine months this year shipments of 10 classifications of steel products were larger than the amounts shipped in all of 1946. On the basis of sheet and strip shipments in the first nine months, the total for all of 1947 will set a record in the vicinity of 18 million tons.

On hot and cold-rolled sheets, however, the prospect for the early part of next year, at least, is for little, if any, improvement with carryover tonnage from fourth quarter taking up a large part of first quarter rollings.

Future developments in the steel market to considerable extent, will hinge upon decisions to be made in Washington for aiding European rehabilitation and combatting inflation at home. Suggested resumption of allocation of basic commodities, such as steel, including possibly some form of price control, gets a cool reception in steel circles. It is felt reimposition of government controls in present circumstances is wholly impracticable and would only serve to demoralize distribution.



DISTRICT STEEL RATES

Percentage of Ingot Capacity Engaged in Leading Districts

	Week Ended Nov. 8	Change	Same Week 1946	Same Week 1945
Pittsburgh	101.5	— 2.5	97.5	75
Chicago	94.5	None	92	82
Eastern Pa.	93.5	+ 1.5	77	74
Youngstown	92	None	91	55
Wheeling	86	— 7.5	89	85
Cleveland	90.5	— 2	94	81
Buffalo	88.5	None	88.5	86
Birmingham	99	None	99	95
New England	86	None	88	82
Cincinnati	91	— 3	93	77
St. Louis	80	None	68	68
Detroit	89	+ 3	86	87
Estimated national rate	96	— 0.5	91.5	76

Based on weekly steelmaking capacity of 1,749,928 net tons for 1947; 1,762,381 net tons for 1946; 1,831,636 tons for 1945.

Situation in scrap is less confused than a week ago but it is uncertain whether prices have jelled at the lower levels recently established. In fact, slightly higher prices were reported in the East. The larger steel mills are marking time on purchases, however, and for the time being, the market is awaiting a thorough price test.

In the face of rising production costs fears are expressed in some circles of possible early increases in finished steel prices. Raw materials are tending upward, the most recent increase involving fluorspar which has been raised $2 per ton. Here and there the price line on steel products is giving way. Last week one producer raised prices on galvanized, standard and cement-coated nails, and on polished and galvanized staples $15 per ton. This interest also raised farm and poultry fence $10 per ton. Another smaller producer increased wire rods $2 per ton.

Estimated national steelmaking rate eased ½ point last week to 96 per cent of capacity as several furnaces went down for routine repairs. Some mills are encountering long delays in repair programs due to materials shortages. Operations dropped 7½ points to 86 per cent in Wheeling, 3 points to 91 per cent in Cincinnati, 2½ points to 101.5 per cent in Pittsburgh, and 2 points to 90.5 per cent in Cleveland. Increases of 3 points to 89 per cent in Detroit and 1½ points to 93.5 per cent in eastern Pennsylvania were reported.

Reflecting scattered price changes announced by a limited number of sellers in the steel industry, all of STEEL's composite price averages changed last week. Finished steel average rose to $76.09 from $75.41; semifinished steel average to $57.20 from $56.80; and steelmaking scrap to $40.42 from $40.25. The steelmaking pig iron average eased to $36.28 from a revised figure of $36.38 the previous week.

COMPOSITE MARKET AVERAGES

	Nov. 8	Nov. 1	Oct. 25	One Month Ago Oct., 1947	Three Months Ago Aug., 1947	One Year Ago Nov., 1946	Five Years Ago Nov., 1942
Finished Steel	$76.09	$75.41	$75.41	$75.41	$75.41	$64.45	$56.73
Semifinished Steel	57.20	56.80	56.80	56.80	56.80	40.60	36.00
Steelmaking Pig Iron	36.28	36.38	36.13	36.18	36.06	27.50	23.00
Steelmaking Scrap	40.42	40.25	42.58	39.85	39.00	22.22	19.17

Finished Steel Composite:—Average of industry-wide prices on sheets, strips, bars, plates, shapes, wire, nails, tin plate, standard and line pipe. Semifinished Steel Composite:—Average of industry-wide prices on billets, slabs, sheet bars, skelp and wire rods. Steelmaking Pig Iron Composite:—Average of basic pig iron prices at Bethlehem, Birmingham, Buffalo, Chicago, Cleveland, Neville Island, Granite City and Youngstown. Steelworks Scrap Composite:—Average of No. 1 heavy melting steel prices at Pittsburgh, Chicago and eastern Pennsylvania. Finished steel, net tons; others, gross tons.

COMPARISON OF PRICES

Representative Market Figures for Current Week; Average for Last Month, Three Months and One Year Ago

Finished material (except tin plate) and wire rods, cents per lb; coke, dollars per net ton; others, dollars per gross ton.

Finished Materials

	Nov. 8, 1947	Oct., 1947	Aug., 1947	Nov., 1946
Steel bars, Pittsburgh	2.90c	2.90c	2.90c	2.50c
Steel bars, del. Philadelphia	3.318	3.301	3.28	2.86
Steel bars, Chicago	2.90	2.90	2.90	2.50
Shapes, Pittsburgh	2.80	2.80	2.80	2.35
Shapes, del. Philadelphia	2.954	2.947	2.94	2.48
Shapes, Chicago	2.80	2.80	2.80	2.35
Plates, Pittsburgh	2.95	2.95	2.95	2.50
Plates, del. Philadelphia	3.17	3.162	3.15	2.558
Plates, Chicago	2.95	2.95	2.95	2.50
Sheets, hot-rolled, Pittsburgh	2.80	2.80	2.80	2.425
Sheets, cold-rolled, Pittsburgh	3.55	3.55	3.55	3.275
Sheets, No. 10 galv., Pittsburgh	3.90	3.90	3.90	†4.05
Sheets, hot-rolled, Gary	2.80	2.80	2.80	2.425
Sheets, cold-rolled, Gary	3.55	3.55	3.55	3.275
Sheets, No. 10 galv., Gary	3.90	3.90	3.90	†4.05
Strip, hot-rolled, Pittsburgh	2.80	2.80	2.80	2.45
Strip, cold-rolled, Pittsburgh	3.55	3.55	3.55	3.05
Bright basic, bess. wire, Pittsburgh	3.675	3.675	3.675	3.05
Wire nails, Pittsburgh	4.625	4.25	4.25	3.75
Tin plate, per base box, Pittsburgh	$5.75	$5.75	$5.75	*$5.25

* Nominal. † Base, No. 24 gage.

Semifinished Material

Sheet bars, Pittsburgh, Chicago	$60.00	$60.00	$60.00	$38.00
Slabs, Pittsburgh, Chicago	47.50	47.50	47.50	39.00
Rerolling billets, Pittsburgh	47.50	47.50	47.50	39.00
Wire rod 7/32 to ½-inch, Pitts.	3.05c	2.925c	2.925c	‡2.30c

‡ Base, No. 5 to 5/16-in.

Pig Iron

	Nov. 8, 1947	Oct., 1947	Aug., 1947	Nov., 1946
Bessemer, del. Pittsburgh (N.&S. sides)	$37.913	$37.879	$37.83	$29.77
Basic, Valley	36.00	36.00	36.00	28.00
Basic, eastern del. Philadelphia	38.84	38.78	38.72	29.93
No. 2 fdry., del. Pgh. (N.&S. sides)	37.41	37.379	37.33	29.27
No. 2 fdry., del Philadelphia	39.34	39.28	39.22	30.43
No. 2 foundry, Chicago	36.00	36.00	36.00	28.50
No. 2 foundry, Valley	36.50	36.50	36.50	28.50
Southern No. 2, Birmingham	34.88	34.88	34.51	24.88
Southern, No. 2, del. Cincinnati	38.74	38.544	39.38	28.94
Malleable, Valley	36.50	36.50	36.50	28.50
Malleable, Chicago	36.50	36.50	36.50	28.50
Charcoal, low phos., fob Lyles, Tenn.	50.00	46.40	44.00	33.00
Ferromanganese, fob cars, Pittsburgh	151.00	151.00	140.25	140.00

Scrap

Heavy melt. steel, No. 1, Pittsburgh	$40.00	$39.90	$39.50	$23.00
Heavy melt. steel, No. 2, E. Pa.	42.50	39.50	38.35	21.90
Heavy melt. steel, No. 1, Chicago	38.75	39.55	39.625	21.75
Heavy melt. steel, No. 1, Valley	40.00	39.50	40.50	20.00
Heavy melt. steel, No. 1, Cleveland	40.00	38.25	38.81	19.50
Heavy melt, steel, No. 1, Buffalo	42.50	39.00	40.88	19.25
Rails for rerolling, Chicago	55.50	51.00	47.125	24.25
No. 1 cast, Chicago	49.00	46.40	43.50	29.00

Coke

Connellsville, beehive furnace	$12.25	$12.15	$12.00	$8.75
Connellsville, beehive foundry	14.50	14.50	14.50	9.50
Chicago, oven foundry, del.	18.60	18.52	18.50	15.10

FINISHED AND SEMIFINISHED IRON, STEEL PRODUCTS

Finished steel quoted in cents per pound and semifinished in dollars per gross ton, except as otherwise noted. Prices apply on an individual producer basis to products within the range of sizes, grades, finishes and specifications produced at its plants. Delivered prices do not include the 3 per cent federal tax on freight.

Semifinished Steel

Carbon Steel Ingots: Rerolling quality, standard analysis, open market, $80-$85. Forging quality $46, Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Buffalo, Youngstown.

Alloy Steel Ingots: Pittsburgh, $56.

Rerolling Billets, Blooms, Slabs: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Birmingham, $45-$50, sales by smaller interests on negotiated basis at $65 or higher.

Forging Quality Billets, Blooms, Slabs: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Birmingham, $55-$58; Detroit, del., $61; eastern Mich., $62.

Alloy Billets, Slabs, Blooms: Pittsburgh, Chicago, Buffalo, Bethlehem, Canton, Massillon, $66, del. Detroit $69, eastern Mich., $70.

Sheet Bars: Pittsburgh, Chicago, Cleveland, Buffalo, Canton, Youngstown, $60; sales in open market $66 to $92.

Skelp: Pittsburgh, Youngstown, 2.60c-2.65c per lb.

Tube Rounds: Pittsburgh, Chicago, Gary, Cleveland, $69-$70.

Wire Rods: Pittsburgh, Chicago, Birmingham, 7/32 to ½-in., inclusive, $2.80-3.30 per 100 lb. 5/16 to 47/64-in., inclusive, $2.75, Cleveland; Galveston, $2.95; Worcester, $2.90-2.95. San Francisco (base del.), $3.52.

Bars

Hot-Rolled Carbon Bars (O.H. only) and Bar-Size Shapes under 3-in.: Pittsburgh, Youngstown, Chicago, Gary, Cleveland, Buffalo, Birmingham, base, 20 tons one size, 2.90c; Detroit, del., 3.05c; eastern Mich., 3.10c; New York, del., 3.351c; Phila., del., 3.318c; San Francisco (base, del.), 3.63-3.95c; Los Angeles (base, del.), 3.625-3.86c; Seattle, 3.85c, base.

Rail Steel Bars: Same basing points as merchant carbon bars, except base is 10 tons. Prices upon application.

Hot-Rolled Alloy Bars: Pittsburgh, Youngstown, Chicago, Canton, Massillon, Buffalo, Bethlehem, base 20 tons one size, 3.30c; Detroit, del., 3.45c; eastern Mich., 3.50c. (Texas Steel Co. uses Chicago base price as maximum fob Fort Worth, Tex., price on sales outside Texas, Oklahoma.)

Cold-Finished Carbon Bars: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, base 20,000-39,999 lb., 3.55c; Detroit, del., 3.70c; Toledo, 3.75c.

Cold-Finished Alloy Bars: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Canton, base, 4.10c; Detroit, del., 4.25c; eastern Mich., 4.30c.

Reinforcing Bars (New Billet): Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Sparrows Point, Buffalo, Youngstown, base, 2.75c; San Francisco (base, del.), 3.33c; Los Angeles (base, del.), 3.325c; Seattle, 3.88c, base.

Reinforcing Bars (Rail Steel): Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Youngstown, Buffalo. Prices upon application.

Iron Bars: Single refined, Pittsburgh 7.15c-†7.70c; double refined, 8.00-†9.75c; Pittsburgh, staybolt, 8.85c-†11.25c.

† Hand puddled.

Sheets

Hot-Rolled Sheets (18 gage and heavier): Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Buffalo, Youngstown, Sparrows Point, Ashland, Ky., base, 2.80c; Granite City, 3.175c; Detroit, del., 2.95c; eastern Mich., del., 3.00c; Philadelphia, del., 3.02c; New York, del., 3.12c; Los Angeles (base, del.), 3.54c; San Francisco, (base, del.), 3.545c. (Andrews Steel Co. quotes Middletown, O., base for shipment to Detroit. Alan Wood Steel Co., Conshohocken, Pa., quotes 3.40c, Sparrows Point equivalent).

Cold-Rolled Sheets: Pittsburgh, Chicago, Cleveland, Gary, Buffalo, Youngstown, Middletown, base, 3.55c; Granite City, 3.65c; Detroit, del., 3.70c; eastern Mich., del., 3.75c; New York, del., 4.001c; Philadelphia, del., 3.968c.

Galvanized Sheets, No. 10: (Based on 5 cent zinc) Pittsburgh, Chicago, Gary, Birmingham, 3.85c-3.95c; Youngstown, Sparrows Point, Canton, Middletown, base, 3.95c; Granite City, 4.05c; New York, del., 4.27c; Philadelphia, del., 4.17c; Los Angeles (base, del.), 4.62c; San Francisco (base, del.), 4.625c.

Corrugated Galvanized Sheets, No. 10: (Based on 5 cent zinc) Pittsburgh, Chicago, Gary, Birmingham base, 3.95c-4.05c.

Culvert Sheets, No. 16 flat: (Based on 5 cent zinc; corrugated 10 cents extra) Pittsburgh, Chicago, Gary, Birmingham: Copper alloy, 4.45c-4.55c; copper-iron or pure iron, 4.80c-4.90c. Granite City 4.65c and 5.00c, respectively. Los Angeles (base, del.), 5.24c; San Francisco (base, del.), 5.245c.

Aluminized Sheets: Hot-dipped, coils or cut to lengths: Pittsburgh, 7.50c.

Stainless-Clad 20%: Pittsburgh, Washington, Coatesville, Pa., No. 304, 22.00c; No. 410, 20.00c; No. 430, 20.50c; No. 446, 27.00c. Prices include annealing and pickling.

Long Ternes, No. 10: Pittsburgh, Chicago, Gary, base, 3.85c-4.05c.

Enameling Sheets, No. 12: Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Middletown, 3.90c-3.95c; Granite City, 4.05c; Detroit, del., 4.10c; eastern Mich., 4.15c.

Electrical Sheets, No. 24: Field: Pittsburgh, Chicago, Gary, 4.50c; Kokomo, Ind., 4.60c. Armature: Pittsburgh, Chicago, Gary, 4.80c; Granite City, Ill., Kokomo, Ind., 4.90c. Electrical: Pittsburgh, Chicago, Gary, 5.30c; Granite City, Kokomo, 5.40c. Motor: Pittsburgh, Chicago, Gary, 6.05c; Granite City, 6.15c. Dynamo: Pittsburgh, 6.75c; Granite City, 6.85c. Transformer 72, 7.25c; 65, 7.95c; 58, 8.65c; 52, 9.45c, Pittsburgh.

Strip

Hot-Rolled Strip: Pittsburgh, Chicago, Gary, Birmingham, Youngstown, base, 2.80c; Detroit, del., 2.95c; eastern Mich., del., 3.00c; San Francisco (base, del.), 3.605c; Los Angeles (base, del.), 3.60c.

Cold-Rolled Strip: 0.25 carbon and less: Pittsburgh, Cleveland, Youngstown, 3.55c; Chicago, base, 3.65c; Detroit, del. 3.70c; eastern Mich., 3.75c; Worcester, base, 3.75c-4.10c.

Cold-Finished Spring Steel: Pittsburgh, Cleveland base: 0.26-0.40 carbon, 3.55c; over 0.40 to 0.60 carbon, 5.05c, over 0.60 to 0.80, 5.65c; over 0.80 to 1.05, 7.15c; over 1.05 to 1.35, 9.45c; add 0.20c for Worcester.

Tin, Terne, Plate

Tin Plate: Pittsburgh, Chicago, Gary, Warren, O., 100-lb base box, $5.75; Granite City, Birmingham, Sparrows Point, $5.85.

Electrolytic Tin Plate: Pittsburgh, Gary, Warren, O., 100-lb base box 0.25 lb tin, $4.85; 0.50 lb tin, $5.05; 0.75 lb tin, $5.25; Granite City, Birmingham, Sparrows Point, $4.95, $5.15, $5.35, respectively.

Tin Mill Black Plate: Pittsburgh, Chicago, Gary, Warren, O., base 29-gage and lighter, 3.90c; Granite City, Birmingham, Sparrows Point, 4.00c.

Manufacturing Ternes (Special Coated): Pittsburgh, Chicago, Gary, 100-lb base box $4.90; Granite City, Birmingham, Sparrows Point, $5.00.

Roofing Ternes: Pittsburgh, per package 112 sheets; 20 x 28 in., coating I.C. 8-lb $14.10.

Plates

Carbon Steel Plates: Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Youngstown, Sparrows Point, 2.95c; Coatesville, Claymont, 3.15c; Geneva, Utah, (base, del.), 3.125c; New York, del. 3.27c; Phila., del., 3.17c; St. Louis, del., 2.77c; Boston, del., 3.423c; San Francisco and Los Angeles, del., 3.67c for sizes and grades produced at Geneva, 3.76c for sizes and grades produced at Fontana, Calif.

(Central Iron & Steel Co., Harrisburg, Pa., 4.45c, basing points.)

Floor Plates: Pittsburgh, Chicago, 4.20c.

Open-Hearth Alloy Plates: Pittsburgh, Chicago, 3.80c-4.137c; Coatesville, 4.50c.

Clad Steel Plates: Coatesville, 10% cladding: Nickel clad, 21.50c; inconel-clad, 30.00c; monel-clad, 29.00c. Pittsburgh, Washington, Coatesville, Pa., 20% stainless-clad, base prices including annealing and pickling: No. 304, 24.00c; No. 410, 22.00c; No. 430, 22.50c; No. 446, 29.00c.

Shapes

Structural Shapes: Pittsburgh, Chicago, Gary, Birmingham, Buffalo, Bethlehem, 2.80c; New York, del., 3.02c; Phila., del., 2.954c; Geneva, Utah (base, del.), 2.975c; Los Angeles (base, del.), 3.41c-3.47c for sizes produced at Torrance, Calif., beyond sizes at Geneva; Los Angeles and San Francisco, del., 3.52c for sizes produced at Geneva; San Francisco, del., 3.41c for sizes produced at Fontana, Calif.

Alloy Structural Shapes: Pittsburgh, Chicago, 3.55c.

Steel Piling: Pittsburgh, Chicago, Buffalo, $3.30 per 100 lb.

Wire and Wire Products

(Fob Pittsburgh, Chicago, Cleveland and Birmingham per 100 pounds).

Wire to Manufacturers in carloads

Bright, basic or bessemer.....*$3.55-3.80
Spring (except Birmingham)....**$4.25-**4.50

Wire Products to Trade

Nails

Standard and cement-coated .....†$4.25-5.00
Galvanized .....‡$4.00-4.75
Staples, polished and galvanized.....$4.25-5.00
Wire, Merchant Quality
Annealed (6 to 8 base)..... §$4.20
Galvanized (6 to 8 base)..... §$4.65
(Fob Pittsburgh, Chicago, Birmingham, per base column)
Woven fence, 15 gage and heavier.... ††91-101
Barbed wire, 80-rod spool ..... ††101
Barbless wire, twisted 101
Fence Posts (no clamps)..... ††90
Bale ties, single loop ..... ††91

* Worcester, $3.65, Duluth, $3.60, base. San Francisco (base, del.), $4.56, bright basic only.

** Worcester $4.60, Duluth and Trenton, N. J., $4.75, base. San Francisco (base, del.) $5.63 for MB spring wire; $5.28 black premier.

† Worcester $4.55, Cleveland $4.35, base. San Francisco (base, del.) $5.33.

‡ Duluth $4.00, Cleveland $4.10, base. San Francisco (base, del.) $5.08.

§ Worcester $4.30, annealed; $4.75, galvanized. Duluth $4.20, annealed; $4.65, galvanized. San Francisco (base, del.) $5.21, annealed; $5.66, galvanized.

†† San Francisco (base, del.): Woven fence, 114; barbed wire, 121; bale ties, 115. Duluth (base): Woven fence, 91; barbed wire, 101; fence posts 90.

Rails, Supplies

Rails: Standard, over 60-lb fob mill, $2.75 per 100 lb. Light rails (billet), Pittsburgh, Birmingham, $3.10 per 100 lb; light rails (rail steel), Williamsport, Pa., Pittsburgh prices upon application.

Relaying, 60 lb and over fob warehouse $55-$56 per net ton.

Supplies: Track bolts, 7.00c; heat treated, 7.25c. Tie plates, $3.05 per 100 lb, fob mill; $3.40 base, Seattle; $3.20, base, Pittsburg, Calif. Splice bars, $3.25 per 100 lb, fob mill. Standard spikes, 4.85c; screw spikes, 6.75c. Axles, 4.10c.

Tubular Goods

Standard Steel Pipe: Base price in carlots, threaded and coupled, to consumers about $200 a net ton. Base discounts Pittsburgh on all types; Lorain on steel butt weld, and seamless; Gary, Ind., 2 points less on steel lap weld and 1 point less on steel butt weld on sizes produced in that district.

	Butt Weld				
In	Blk.	Gal.	In	Blk.	Gal.
⅛	46	19½	1	56	41½
¼	47	25	1¼	56½	42
⅜	44	22	1½	57	42½
½	50½	34½	2	57½	43
¾	53½	38½	2½ & 3	58	43½

	Lap Weld		Elec. Weld		Seamless	
In.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.
2	49	34	48½	33½	48	33
2½-3	52	37	51½	36½	51	36
3½-6	54	39	53½	38½	53	38

Line Steel Pipe: Base price in carlots to consumers about $200 a net ton. Base discounts Pittsburgh and Lorain, O.

In.	Butt Weld	In.	Butt Weld
⅛	45	1	55
¼	46	1¼	55½
⅜	43	1½	56
½	49½	2	56½
¾	52½	2½ & 3	57

In.	Lap Weld	Elec. Weld	Seamless
2	48	47½	47
2½ & 3	51	50½	50
3½-6	53	52½	52
8	53½	53	52½
10	53	52½	52
12	52	51½	51

Boiler Tubes: Net base prices per 100 ft, fob Pittsburgh, in carload lots, minimum wall thickness, cut lengths 4 to 24 feet, inclusive.

		——Seamless——		—Elec. Weld—	
O.D. Sizes	B.W.G.	Hot Rolled	Cold Drawn	Hot Rolled	Cold Drawn
1"	13	....	$11.87	$11.51	$11.51
1¼"	13	....	14.06	11.48	13.64
1½"	13	$13.08	15.69	12.69	15.22
1¾"	13	14.88	17.85	14.43	17.31
2"	13	16.67	19.99	16.17	19.39
2¼"	13	18.58	22.29	18.02	21.62
2¼"	12	20.47	24.54	19.86	23.80
2½"	12	22.42	26.87	21.75	26.06
2¾"	12	23.76	28.48	23.05	27.63
3"	12	24.93	29.90	24.18	29.00
3¼"	11	29.03	34.81	28.16	33.77
3½"	11	31.17	37.39	30.23	36.27
4"	10	38.69	46.38	37.53	44.99
4½"	9	51.28	61.50	....	....
5"	9	59.39	71.18	....	....
6"	7	91.13	109.27	....	....

Pipe, Cast Iron: Class B, 6-in. and over $74.50 per net ton, Birmingham; $79.50, Burlington, N. J.; $86.12, del. Chicago; 4-in. pipe, $5 higher; class A pipe, $5 a ton over Class B.

Bolts, Nuts

Fob Pittsburgh, Cleveland, Birmingham, Chicago; add 15c per cwt, Lebanon, Pa. Additional discounts: 5 for carloads; 15 for full containers, except tire, step and plow bolts.

Carriage and Machine Bolts

½-in. and smaller; up to 6 in. in length	45 off
⅝ and ⅝ x 6-in. and shorter	46 off
¾-in. and larger x 6-in. and shorter	43 off
All diameters longer than 6-in.	41 off
Tire bolts	35 off
Step bolts	43 off
Plow bolts	54 off
Lag bolts	
All diameters 6 in. and shorter	46 off
All diameters longer than 6 in.	44 off

Stove Bolts

In packages, nuts separate, 65-10 off; bulk 75 off on 15,000 of 3-in. and shorter, or 5000 over 3-in., nuts separate.

Nuts

Semifinished hexagon	A.S. Light	A.S. Reg. and Heavy
⅞-in. and smaller	46 off	.....
½-in. and smaller	.....	44 off
½-in.-1-in.	44 off	.....
⅝-in.-1-in.	.....	43 off
1⅛-in.-1½-in.	42 off	41 off
1⅝-in. and larger	.....	35 off

Additional discount of 15 for full containers.

Hexagon Cap Screws (Packaged)

Upset 1-in. smaller by 6-in. and shorter (1020 bright)	53 off
Upset (1035 heat treated)	
⅝ and smaller x 6 and shorter	48 off
¾, ⅞, & 1 x 6 and shorter	44 off

Square Head Set Screws

Upset 1-in. and smaller	57 off
Headless, ¼-in. and larger	40 off
No. 10 and smaller	52 off

Rivets

Fob Pittsburgh, Cleveland, Chicago, Birmingham

Structural ½-in. and larger	5.65c
Lebanon, Pa.	5.80c
7/16-in. and under	55 off
Lebanon, Pa.	55 off plus 15c per cwt.

Washers, Wrought

Fob Pittsburgh, Chicago, Philadelphia, to jobbers and large nut and bolt manufacturers, lcl ..... $1-$2 off

Tool Steels

Tool Steel: Pittsburgh, Bethlehem, Syracuse, Canton, O., Dunkirk, N. Y., base, cents per lb; reg. carbon 16.00-17.00c; extra carbon 20.00c; special carbon 24.00c; oil-hardening 26.00c; high carbon-chromium 47.00c.

W	Cr	V	Mo	Base, Per lb
18.00	4	1	...	82.00c
1.5	4	1	8.5	59.00c
12	3	0.50	...	67.00c
6.40	4.15	1.90	5	63.00c
5.50	4.50	4	4.50	80.00c

Stainless Steels

Base, Cents per lb

Grade	Bars, Drawn Wire, Structurals	Plate	Sheets	Hot Rolled Strip	Cold Rolled Strip
CHROMIUM NICKEL STEELS					
301....	26.00c	29.50c	37.00c	22.00c	28.00c
302....	26.00	29.50	37.00	23.50	30.50
303....	28.50	31.50	39.00	29.50	36.00
304....	27.50	31.50	39.00	25.50	32.50
308....	31.50	37.00	44.50	31.00	38.00
309....	39.00	43.50	51.00	40.50	51.00
310....	53.50	56.50	57.50	53.00	61.00
316....	43.50	48.00	52.00	43.50	52.00
321....	31.50	37.00	44.50	32.00	41.50
347....	36.00	41.50	49.00	36.00	45.50
431....	21.00	24.00	31.50	19.00	24.50
440A..	26.00	31.00	36.50	26.00	30.50
STRAIGHT CHROMIUM STEEL					
403....	23.50	27.00	32.00	23.00	29.50
410....	20.50	23.50	29.00	18.50	24.00
416....	21.00	24.00	29.50	20.00	25.50
420....	26.00	31.00	36.50	26.00	39.50
430....	21.00	24.00	31.50	19.00	24.50
430F...	21.50	24.50	32.00	20.50	27.00
442....	24.50	28.00	35.50	26.00	35.00
443....	24.50	28.00	35.50	26.00	35.00
446....	30.00	33.00	39.50	38.00	56.50
*501...	9.00	13.00	17.50	13.00	18.50
*502...	10.00	14.50	18.50	14.50	19.50
†STAINLESS CLAD STEEL (20%)					
304....	....	....	24.00	22.00	....	....
410....	....	....	22.00	20.00	....	....
430....	....	....	22.50	20.50	....	....
446....	....	....	29.00	27.00	....	....

* Low chromium. † Fob Pittsburgh and Washington, Pa.; plate prices include annealing and pickling.

RAW MATERIAL AND FUEL PRICES

Minimum delivered prices do not include 3 per cent federal tax.

Pig Iron

Per Gross Ton	Basic	No. 2 Foundry	Malleable	Bessemer
Bethlehem, Pa., base	$37.00	$37.50	$38.00	$38.50
Newark, N. J., del.	39.02	39.52	40.02	40.52
Brooklyn, N. Y., del.	....	40.80	44.30	....
Philadelphia, del.	38.84	39.34	39.84	40.34
Birmingham, base	32.88*	33.38*	....	....
Baltimore, del.	....	40.42	....	....
Chicago, del.	....	36.72	....	....
Cincinnati, del.	....	38.74	....	....
Newark, N. J., del.	....	39.14	....	....
Philadelphia, del.	....	38.96	....	....
St. Louis, del.	....	37.77	....	....
Buffalo, base	36.00*	36.00*	36.50*	37.00
Boston, del.	43.128	43.128	46.63	44.13
Rochester, del.	38.02	38.02	38.52	39.02
Syracuse, del.	38.75	38.75	39.25	39.75
Canton, Massillon, O., base	35.50	36.00	36.50	....
Chicago, base	35.50	36.00	36.50	37.00
Milwaukee, del.	36.95	37.45	37.95	38.45
Muskegon, Mich., del.	....	40.21	40.71	....
Cleveland, fob furnace	35.50*	36.00*	36.50*	37.00
Akron, del.	37.34	37.84	38.34	38.84
Duluth, base	36.00	36.50	37.00	37.50
Erie, Pa., base	35.50	36.00	36.50	37.00
Everett, Mass., base	....	45.00	45.50	....
Granite City, Ill., base	36.50	37.00	....	....
St. Louis, del.	37.33	37.83	....	....
†Neville Island, Pa., base	36.00	36.50	36.50	37.00
Pittsburgh, del., N.&S. Sides	36.913	37.413	37.413	37.913
Provo, Utah, base	36.00	36.50	....	....
Seattle, Tacoma, Wash., del.	....	43.03	....	....
Portland, Oreg., del.	....	43.03	....	....
Sharpsville, Pa., base	36.00	36.50	36.50	37.00
Steelton, Pa., base	37.00	37.50	38.00	38.50
Struthers, O., base	36.50	37.00	37.00	37.50
Swedeland, Pa., base	41.00	41.50	42.00	42.50
Troy, N. Y., fob furnace	39.50	....	40.00	....
Toledo, O., base	35.50	36.00	36.50	37.00
Cincinnati, del.	39.35	39.85	....	....
Youngstown, O., base	36.00	36.50	36.50	37.00
Mansfield, O., del.	39.28	39.78	39.78	40.28

† To Neville Island base add: 72.6c for McKees Rocks, Pa., $1.111 Lawrenceville, Homestead, McKeesport, Ambridge, Monaco, Aliquippa; $1.463 Oakmont, Verona; $1.639 Brackenridge.

* Republic Steel Corp., quotes $3 a ton higher at Birmingham, effective Aug. 13; $2.00 higher for No. 2 foundry and malleable and $1.50 higher for basic at Buffalo and $5.25 higher at Cleveland, effective on shipments during week ended Nov. 9.

Blast Furnace Silvery Pig Iron

6.00-6.50 per cent (base)....$45.50
6.51-7.00..$46.75 9.01- 9.50. 53.00
7.01-7.50.. 48.00 9.51-10.00. 54.25
7.51-8.00.. 49.25 10.01-10.50. 55.50
8.01-8.50.. 50.50 10.51-11.00. 56.75
8.51-9.00.. 51.75 11.01-11.50. 58.00

Fob Jackson, O., per gross ton; Buffalo base $1.25 higher. Buyer may use whichever base is more favorable.

Bessemer Ferrosilicon

Prices same as for blast furnace silvery iron, plus $1 per gross ton. **Electric Furnace Silvery Pig Iron:** Si 14.01-14.50%, $70.75, Jackson, O.; $73.75, Niagara Falls; $73, open-hearth and foundry grade, Keokuk, Iowa. Add $1 a ton for each additional 0.5% Si to 18%; 50c for each 0.5% Mn over 1%; $1 a ton for 0.045% max. phos.

Charcoal Pig Iron

Semi-cold blast, low phosphorus. Fob furnace, Lyles, Tenn....$50.00 (For higher silicon irons a differential over and above the price of base grade is charged as well as for the hard chilling iron, Nos. 5 and 6.)

Gray Forge

Neville Island, Pa. $36.00

Low Phosphorus

Steelton, Pa., Buffalo, Troy, N. Y., $42.00. Intermediate phosphorus, Central furnace, Cleveland, $39.00.

Differentials

Basing point prices are subject to following differentials:

Silicon: An additional charge of 50 cents a ton for each 0.25 per cent silicon in excess of base grade (1.75% to 2.25%).

Phosphorus: A reduction of 38 cents a ton for phosphorus content of 0.70 per cent and over.

Manganese: An additional charge of 50 cents a ton for each 0.50 per cent, or portion thereof, manganese in excess of 1%.

Nickel: An additional charge for nickel content as follows: Under 0.50%, no extra; 0.50% to 0.74%, inclusive, $2 a ton; for each additional 0.25% nickel, $1 a ton.

Metallurgical Coke

Price per Net Ton

Connellsville, furnace	$12.00-$12.50
Connellsville, foundry	14.00- 15.00
New River, foundry	12.50
Wise county, foundry	11.15
Wise county, furnace	10.65

Oven Foundry Coke

Kearney, N. J., ovens	$17.85
Chicago, outside del.	17.60
Chicago, del.	18.60
Terre Haute, del.	18.15
Milwaukee, ovens	18.25
New England, del.	19.60
Birmingham, del.	15.10
Indianapolis, ovens	17.00
Cincinnati, del.	16.60
Ironton, O., ovens	15.50
Painesville, O., ovens	16.60
Cleveland, del.	18.00
Buffalo, del.	18.75
Detroit, del.	17.75
Philadelphia, ovens	16.90
Swedeland, Pa., ovens	16.90
Portsmouth, O., ovens	16.00
Fairmont, W. Va., ovens	15.75
Pittsburgh, del.	17.71

Coal Chemicals

Spot, gal. freight allowed east of Omaha. Effective as of Apr. 1, 1947.

Pure and 90% benzol	19.00c
Toluol, two degrees	23.00c
Industrial xylol	23.00c
Solvent naphtha	26.00c

Per pound fob works

Phenol (car lots, returnable drums)	11.25c
Do., less than carlots	12.00c
Do., tank cars	10.25c

Eastern plants, per pound

Naphthalene flakes, balls, bbl, to jobbers, "house-hold use"	9.50c

Per ton, bulk, fob plants

Sulphate of ammonia	$30.00

Refractories

Per 1000, fob shipping point

Net Prices

Fire Clay Brick

Super Duty

Pa., Mo., Ky.	$87.00

High Heat Duty

Pa., Ill., Md., Mo., Ky.	70.00
Ala., Ga.	70.00
N. J.	75.00

Intermediate Heat Duty

Ohio	64.00
Pa., Ill., Md., Mo., Ky.	64.00
Ala., Ga.	56.00
N. J.	67.00

Low-Heat Duty

Pa., Md., Ohio	56.00

Ladle Brick

(Pa., O., Va., Mo.)

Dry Press	47.00
Wire Cut	45.00

Malleable Bung Brick

All bases	80.00

Silica Brick

Pennsylvania	70.00
Joliet, E. Chicago	79.00
Birmingham, Ala.	70.00

Basic Brick

Net tons, fob Baltimore, Plymouth Meeting, Chester, Pa.

Chrome brick	59.00
Chem. bonded chrome	59.00
Magnesite brick	81.00
Chem. bonded magnesite	70.00

Magnesite

Domestic dead-burned grains, net ton, fob Chewelah, Wash.

Bulk	24.00
Single bags	28.00

Dolomite

Domestic, dead-burned, bulk, net ton, fob Billmeyer, Blue Bell or Williams, Pa., Millville, W. Va., Nario, Millersville, Martin, Gibsonburg or Woodville, O., $11.05; Midwest (fob Thornton or McCook, Ill.), add $0.10; Missouri Valley (fob Dolly Siding, and Bonne Terre, Mo.), add $0.20.

Ores

Lake Superior Iron Ore

Gross ton, 51½% (Natural) Lower Lake Ports

Old range bessemer	$5.95
Old range nonbessemer	5.80
Mesabi bessemer	5.70
Mesabi nonbessemer	5.50
High phosphorus	5.55

Eastern Local Ore

Cents, units, del. E. Pa.

Foundry and basic 56.63% contract	15.25

Foreign Ore

Cents per unit, cif Atlantic ports

No. African low phos.	Nom.
Swedish basic, 60 to 68%	13.50
Spanish, No. African basic, 50 to 60%	Nom.
Brazil iron ore, 68-69% fob Rio de Janeiro, nom.	5.50-6.50

Tungsten Ore

Wolframite and scheelite per short ton unit, duty paid	$30-$32

Manganese Ore

48-50%, duty paid, fob cars, New York, Philadelphia, Baltimore, Norfolk, Va., Mobile, Ala., New Orleans, 65.00c-67.00c.

Chrome Ore

Gross ton fob cars, New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., and/or Tacoma, Wash.

(S S paying for discharge; dry basis, subject to penalties if guarantees are not met.)

Indian and African	
48% 2.8:1	$37.50
48% 3:1	39.00
48% no ratio	31.00
South African (Transvaal)	
44% no ratio	$25.50-$26.00
45% no ratio	26.50
48% no ratio	28.50
50% no ratio	29.50
Brazilian—nominal	
44% to 2.5:1 lump	$33.65
48% 3:1 lump	43.50
Rhodesian	
45% no ratio	$27-$27.50
48% no ratio	30.00
48% 3:1 lump	39.00
Domestic (seller's nearest rail)	
48% 3:1	$39.00

Molybdenum

Sulphide conc., lb., Mo. cont., Mines	$0.75

Fluorspar

Metallurgical grade, fob shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content, 70% or more, $35; less than 60% $32.

HIGH-STRENGTH—LOW-ALLOY STEELS

Prices in dollars per 100 pounds

	Pittsburgh	Chicago	Gary	Youngstown	Sparrows Point	Buffalo	Bethlehem	Canton	Massillon
Sheets, Hot-Rolled	4.30	4.30	4.30	4.30	4.30	4.30	...	...	...
Cold-Rolled	5.30	5.30	5.30	5.30	...	5.30	...	...	...
Galvanized	5.85	...	...	...	...	...	...	...	...
Strip, Hot-Rolled	4.30	4.30	4.30	4.30	...	...	...	...	...
Cold-Rolled	5.30	5.30*	5.30*	5.30	...	...	...	...	...
Shapes, structural	4.30	4.30	...	4.30	...	...	4.30	...	...
Plates	4.55	4.55	4.55	...	4.55	...	...	...	...
Bars, Small Shapes	4.45	4.45	4.45	4.45	...	4.45	...	4.45	4.45

* Nax High Tensile, produced by Great Lakes Steel Corp., quoted 10 cents higher.

WAREHOUSE STEEL PRICES

Prices, cents per pound, for delivery within switching limits, subject to extras.

	SHEETS					STRIP		BARS				PLATES	
	H-R 10G	C-R 10G	C-R 17G	Gal. *10G	Gal. *24G	†H-R	†C-R	H-R Rds. ⅝" to 3"	C-F Rds. ½" & up	H-R Alloy (8140)	Structural Shapes	Carbon ⅜"-¾"	Floor ¾" & Thicker
Boston (city)	4.96	6.03[4]	5.73[4]	6.16[4]	7.41[4]	5.04	6.73	4.95	5.63	7.22	4.82	5.11	6.79
††New York (city)	4.91	6.12	5.82[9]	6.11	7.36	5.03	....	5.02	5.57	7.00[9]	4.75	5.06	6.76
New York (country)	4.76	5.97	5.67[9]	5.96	7.21	4.88	....	4.87	....	....	4.60	4.91	6.61
Philadelphia (city)	4.67	6.28	5.88	5.87	7.12	4.78	5.68	4.83	5.53	6.95[9]	4.55	4.82	6.31
Philadelphia (country)	4.57	6.18	5.78	....	....	4.68	5.58	4.73	....	6.85[9]	4.45	4.72	6.21
Baltimore (city)	4.31†	5.91	5.61	5.71	6.96	4.76	....	4.81	5.51	....	4.68	4.76	6.26
Baltimore (country)	4.21†	5.81	5.51	5.50	6.75	4.66	....	4.71	....	....	4.58	4.66	6.16
Washington (city)	4.75	....	....	....	....	4.95	....	5.00	5.60[12]	....	4.90	4.95	6.60
Washington (country)	4.65	....	....	....	....	4.85	....	4.90	....	....	4.80	4.85	6.50
Norfolk, Va.	4.80	....	....	....	....	....	....	5.10	5.90	....	5.05	5.05	6.80
Memphis, Tenn. (city)	4.82[20]§§	5.87[20]†	....	6.37	....	5.02[20]	....	4.97[20]	5.87	....	4.97[20]	5.17[20]	6.87[20]
Memphis, Tenn. (country)	4.72[20]§§	5.77[20]†	....	6.27	....	4.92[20]	....	4.87[20]	5.77	....	4.87[20]	5.07[20]	6.77[20]
Buffalo (city)	4.45	....	5.20[8]	6.00	....	4.70	5.65	4.40	5.10	6.65	4.40	4.95	6.20
Buffalo (country)	4.30	....	5.05[8]	5.55	....	4.25	5.50	4.25	4.95	6.65	4.25	4.45	5.75
Pittsburgh (city)	4.25§§	....	5.10[8]†	5.65	6.90	4.35	5.35	4.40	5.10	6.65	4.40	4.60	5.90
Pittsburgh (country)	4.15§§	....	4.90[8]†	5.50	6.75	4.20	5.20	4.25	4.95	6.65	4.25	4.45	5.75
Cleveland (city)	4.45	5.50[8]	5.20[8]	5.79	7.04	4.52	5.35	4.40	5.10	6.93	4.65	4.60	6.15
Cleveland (country)	4.30	5.35[8]	5.05[8]	....	....	....	5.20	4.25	4.95	....	....	4.40	....
Cincinnati	4.671	5.516[8]	....	5.716	6.466	4.694	....	4.703	5.353	....	4.744	4.903	6.244
Detroit	4.55	....	5.30	....	....	4.72	5.63	4.50	5.22	7.10	4.77	4.88	6.28
Indianapolis	4.55	5.32[8]	....	5.87	7.12	4.65	5.90	4.70‡‡	5.40	8.85	4.70	4.90	6.35
Chicago (city)	4.45	5.50[8]	5.20[8]	5.65	6.90	4.35	5.45	4.40	5.10	6.65[9]	4.40	4.60	6.05
Chicago (country)	4.30	5.35[8]	5.05[8]	5.50	6.75	4.20	5.30	4.25	4.95	6.65[9]	4.25	4.45	5.90
Milwaukee	4.629	5.679[8]	5.379[8]	5.829	7.079	4.529	5.629	4.579	5.279	6.979[9]	4.579	4.779	6.229
St. Louis	4.749	5.799[9]	5.499[8]	5.974	7.224	4.649	5.774	4.699	5.424[12]	7.124	4.699	4.899	6.349
Birmingham (city)	4.45[30]§§	....	....	5.65	....	4.45[30]	....	4.40[30]	5.93[33]	....	4.40	4.65	6.86
Birmingham (country)	4.30[30]§§	....	....	5.50	....	4.30[30]	....	4.25[30]	....	....	4.25	4.50	....
New Orleans	4.98[30]••	....	6.29[18]	....	....	5.18[30]	....	5.13[30]••	6.29[11]	....	5.03[30]••	5.33[30]	7.29[30]
Omaha, Nebr.	5.365	....	....	6.565	7.815	5.265	....	5.315	6.015	....	5.315	5.515	6.965
Houston, Tex.	5.50[1]	....	....	5.50	....	6.00[1]	....	5.35[1]	....	6.35	5.85	5.85	6.50
San Francisco	5.20[21]	6.65[8]	....	6.85[8]	7.75[8]	5.75[21]	8.70[18]	5.05[21]	7.00[12]	9.35	5.20[21]	5.30[21]	7.10[21]
Seattle, Tacoma, Wash.	5.30[17]§§	....	7.10[8]‡	6.70	....	5.60[17]	....	5.45[17]	7.45[19]	8.50[12]	5.25[17]	5.45[17]	7.55[17]
Portland, Oreg.	5.30[17]§§	....	7.10[8]‡	6.70	....	5.60[17]	....	5.45[17]	7.45[19]	....	5.25[17]	5.45[17]	7.55[17]

Base Quantities: 400 to 1999 lb except as noted: Cold-rolled strip, 2000 lb and over, cold finished bars, 1000 lb and over; galvanized sheets, 450 to 1499 lb; [1]—any quantity; [2]—300 to 1999 lb; [3]—150 to 2249 lb; [4]—three to 24 bundles; [5]—450 to 1499 lb; [6]—one bundle to 1499 lb; [7]—one to nine bundles; [8]—400 to 1499 lb; [9]—1000 to 1999 lb; [10]—450 to 39,999 lb; [11]—1000 to 39,999 lb; [12]—1000 lb and over; [13]—400 to 14,999 lb; [14]—400 to 39,999; [15]—2000 lb and over; [16]—1000 to 4999 lb; [17]—300 to 9999 lb; [18]—1500 to 1999 lb; [19]—1500 to 39,999 lb; [20]—400 to 3999 lb; [21]—400 lb and over; [22]—500 to 1499 lb.

• Include gage and coating extra, except Birmingham (coating extra excluded); † does not include gage extras; ‡ 15 gage; § as rolled; •• add 0.46 for sizes not rolled in Birmingham; †† same prices quoted for Jersey City, N. J.; ‡‡ add 15c for 100 lb for slow moving items; §§ 18 gage and heavier.

PRICES OF LEADING FERROALLOYS PRODUCTS

MANGANESE ALLOYS

Spiegeleisen: (19-21% Mn, 1-3% Si.) Carlot per gross ton, $47, Palmerton, Pa., $51, Pittsburgh. 16% to 19% Mn., $46, Palmerton, $50, Pittsburgh.

Standard Ferromanganese: (Mn 78-82%, C 7% approx.). Carload, lump, bulk $145 per gross ton of alloy, carload packed $153, ton lot $165, less ton $172; fob New Orleans, Mobile, Philadelphia, Baltimore, or New York. Carload, lump, bulk $151, fob cars Pittsburgh, including 50c switching charge. Add, or subtract, $1.80 for each 1%, or fraction thereof, of contained manganese over 82% or under 78%.

West Coast Prices: Carload (80,000 lb or more), lump, bulk, same price and basing points as above. All other prices for shipment from Pacific Coast warehouses, add $26.21 to above prices. Delivery is fob Portland, Los Angeles, South San Francisco, or Seattle warehouses, with railroad freight allowed on shipments of 25 gross tons or more.

Low-Carbon Ferromanganese, Regular Grade: (Mn 80-85%). Eastern Zone, carload, lump, bulk, max. 0.10% C, 22.5c per lb of contained Mn, carload packed 23c, ton lot 23.6c, less ton 24.2c; Central, add 0.3c for c.l. and 1.1c for l.c.l.; Western, add 0.7c for c.l. and 4.4c for l.c.l. Freight allowed. Deduct 0.5c for max 0.15% C grade from above prices, 1c for max. 0.30% C, 1.5c for max. 0.50% C, and 4.5c for max. 0.75% C—max. 7% Si. **Special Grade:** (Mn 90% approx., C 0.07% max., P 0.06% max.). Add, 0.5c to above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.5% max., Si 1.5% max.). Eastern Zone, carload, lump, bulk 16.5c per lb of contained Mn, carload packed 17c, ton lot 17.6c, less ton 18.2c; Central, add 0.3c for c.l. and 1.1c for l.c.l.; Western, add 0.7c for c.l. and 4.4c for l.c.l. Freight allowed. Spot, add 0.25c.

Manganese Metal: (Mn 96% min., Fe 2% max., Si 1% max., C 0.20% max.). Eastern Zone, carload, 2" x D, bulk 32c per lb of metal, carload packed 32.5c, ton lot 34c, less ton 36c; Central, add 1c for c.l. and 1.45c for l.c.l.; Western, add 1.45c for c.l. and 2.4c for l.c.l. Freight allowed. Spot, add 2c.

Silicomanganese: (Mn 65-70%). Eastern Zone, contract, lump, bulk, 1.50% C grade, 17-20% Si, 7.4c per lb of alloy, carload packed, 7.95c, ton lot 8.45c, less ton 8.95c; Central, add 0.25c for c.l. and 0.6c for l.c.l.; Western, add 0.8c for c.l. and 2.5c for l.c.l. Freight allowed. For 2.0% C grade, Si 15-17%, deduct 0.2c from above prices. Spot, add 0.25c.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Eastern Zone, contract, c.l., lump, bulk 17.6c per lb of contained Cr, c.l., packed 18.2c, ton lot 18.8c, less ton 19.5c; Central, add 0.4c for c.l. and 1.3c for l.c.l.; Western, add 0.55c for c.l. and 2.1c for l.c.l. Freight allowed. Spot, add 0.25c.

"SM" High-Carbon Ferrochrome: (Cr 60-65%, Si 4-6%, Mn 4-6%, C 4-6%). Add 1.1c to high-carbon ferrochrome prices.

Foundry Ferrochrome: (Cr 62-66%, C 5-7%). Eastern Zone, contract, c.l., 8MxD, bulk 19.1c per lb of contained Cr, c.l., packed 19.7c, ton lot 20.4c, less ton 21.35c; Central, add 0.4c for c.l. and 1.3c for l.c.l.; Western, add 0.55c for c.l. and 2.1c for l.c.l. Freight allowed. Spot, add 0.25c.

Low-Carbon Ferrochrome: (Cr 67-72%). Eastern Zone, contract, carload, lump, bulk, max. 0.03% C 27c per lb of contained Cr, 0.04% C 26c, 0.05% C 25.5c, 0.06% C 25c, 0.10% C 24.5c, 0.15% C 24.0c, 0.20% C 23.75c, 0.50% C 23.5c, 1% C 23.0c, 2% C 22.5c. Carload packed add 0.8c, ton lot add 1.35c, less ton add 2.35c; Central, add 0.4c for c.l. and 0.65c for l.c.l.; Western, add 0.5c for c.l. and 1.85c for l.c.l. Freight allowed. Spot, add 0.25c.

"SM" Low-Carbon Ferrochrome: (Cr 62-66%, Si 4-6%, Mn 4-6%, and C 1.25% max.). Eastern Zone, contract, carload, lump, bulk 23c per lb of contained chromium, carload, packed 23.8c, ton lot 24.35c, less ton 25.35c; Central, add 0.4c for c.l. and 0.65c for l.c.l.; Western, add 0.5c for c.l. and 1.85c for l.c.l. Freight allowed. Spot, add 0.25c.

Low-Carbon Ferrochrome, Nitrogen Bearing: Add 2c to 0.10% C low-carbon ferrochrome prices for approx. 0.75% N. Add 2c for each 0.25% of N above 0.75%.

Chromium Metal: (Min. 97% Cr and 1% Fe.). Eastern Zone, contract, carload, 1" x D, bulk, max. 0.50% C grade, 87c per lb of contained chromium, carload packed 88c, ton lot 89.5c, less ton 91.5c; Central, add 1.5c for c.l. and 2.5c for l.c.l.; Western, add 2.75c for c.l. and 4.5c for l.c.l. Freight allowed. Spot, add 5c.

SILICON ALLOYS

50% Ferrosilicon: Eastern Zone, contract, carload, lump, bulk 8.8c per lb of contained Si, carload packed 10c, ton lot 10.65c, less ton 11.3c; Central, add 0.5c for c.l. and 1.25c for l.c.l.; Western, add 0.7c for c.l. and 1.8c for l.c.l. Freight allowed. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max.). Add 1.3c to 50% Ferrosilicon prices.

75% Ferrosilicon: Eastern Zone, contract, carload, lump, bulk 11.2c per lb of contained Si, carload packed 12.25c, ton lot 12.85c, less ton 13.45c; Central, add 0.3c for c.l. and 0.75c for l.c.l.; Western, add 1.05c for c.l. and 5c for l.c.l. Freight allowed. Spot, add 0.3c.

85% Ferrosilicon: Eastern Zone, contract, carload, lump, bulk 12.7c per lb of contained Si, carload packed 13.7c, ton lot 14.25c, less ton 14.8c; Central, add 0.3c for c.l. and 0.7c for l.c.l.; Western, add 1.05c for c.l. and 4.4c for l.c.l. Freight allowed. Spot, add 0.25c.

Low-Aluminum 85% Ferrosilicon: (Al 0.50% max.). Add 0.7c to 85% Ferrosilicon prices.

90-95% Ferrosilicon: Eastern Zone, contract, carload, lump, bulk, 14.35c per lb of contained Si, carload packed 15.35c, ton lot 15.85c, less ton 16.35c; Central, add 0.3c for c.l. and 0.65c for l.c.l.; Western, add 1c for c.l. and 4c for l.c.l. Freight allowed. Spot, add 0.25c.

Low-Aluminum 90-95% Ferrosilicon: (Al 0.50% max.). Add 0.65c to above 90-95% Ferrosilicon prices.

Silicon Metal: (Over 97% Si and 1% max. Fe). Eastern Zone, c.l., lump, bulk, regular, 16.5c per lb of Si, c.l. packed 17.5c, ton lot 18c, less ton 18.5c; Central, add 0.6c for c.l. and 2.25c for l.c.l.; Western, add 1.2c for c.l. and 4c for l.c.l. Add 1c for max. 0.20% calcium grade. Add 1.5c for max. 0.10% calcium grade. Deduct 0.4c for max. 2% Fe grade, analyzing over 96% Si. Spot, add 0.25c.

Alsifer: (Approx. 20% Al, 40% Si, 40% Fe). Contract basis fob Niagara Falls, N. Y., lump per lb c.l. 6.50c; ton lots packed, 7c; 200 to 1999 lb, 7.75c; smaller lots, 8.25c. Spot up 0.5c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx. 3¾ lb each and containing exactly 2 lb of Cr). Eastern Zone, contract, carload, bulk, 11.1c per lb of briquet, carload packed 11.6c, ton lot 12c, less ton 12.4c; Central, add 0.25c for c.l. and 0.9c for l.c.l.; Western, add 0.35c for c.l. and 1.5c for l.c.l. Freight allowed. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx. 3 lb and containing exactly 2 lb of Mn). Eastern Zone, contract, carload, bulk, 8c per lb of briquet, c.l. packed, 8.6c, ton lot 9c, less ton 9.4c; Central, add 0.25c for c.l. and 0.6c for l.c.l.; Western, add 0.8c for c.l. and 2.5c for l.c.l. Freight allowed. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx. 3½ lb and containing exactly 2 lb of Mn and approx. ½ lb of Si). Eastern Zone, contract, c.l., bulk 7.65c per lb of briquet, c.l. packed 8.25c, ton lot 8.65c, less ton 9.05c; Central, add 0.25c for c.l. and 0.6c for l.c.l.; Western, add 0.8c for c.l. and 2.5c for l.c.l., freight allowed. Add 0.25c for notching. Spot, add 0.25c.
Silicon Briquets: (Large size—weighing approx. 5 lb and containing exactly 2 lb of Si). Eastern Zone, contract, carload, bulk 4.65c per lb of briquet, c.l. packed 5.25c, ton lot 5.65c, less ton 6.05c. (Small size—weighing approx. 2½ lb and containing exactly 1 lb of Si). Eastern Zone, carload, bulk 4.8c, c.l. packed 5.4c, ton lot 5.8c, less ton 6.2c; Central, add 0.25c for c.l. and 0.6c for l.c.l.; Western, add 0.45c for c.l. and 0.9c for l.c.l. Freight allowed. Add 0.25c for notching, small size only. Spot, add 0.25c.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18%, and Si 53-59%). Eastern Zone, contract, carload, lump, bulk 16.75c per lb of alloy, carload packed 17.35c, ton lot 18.85c, less ton 19.85c; Central, add 0.5c for c.l. and 0.85c for l.c.l.; Western, add 2.55c for c.l. and 2.6c for l.c.l. Freight allowed. Spot, add 0.25c.
Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.50-3%). Eastern Zone, contract, carload, lump, bulk 15.5c per lb of alloy, carload packed 16.5c, ton lot 18c, less ton 19c; Central, add 0.5c for c.l. and 0.75c for l.c.l.; Western, add 2.55c for c.l. and 2.90c for l.c.l. Freight allowed. Spot, add 0.25c.

VANADIUM ALLOYS

Ferrovanadium: Open Hearth Grade (Va 50-55%, Si 8% max., C 3% max.). Eastern Zone, contract, any quantity, $2.90 per lb of contained Va; Central, add 2c for c.l. and 3c for l.c.l.; Western, add 6c for c.l. and 9c for l.c.l. Freight allowed. Spot, add 10c. **Special Grade** (Va 50-55%, Si 4% max., C 1% max.), $3. **High Speed Grade** (Va 50-55%, Si 1.50% max., C .20% max.), $3.10.
Vanadium Oxide: All Zones, contract, less carload lots, $1.20 per lb of contained V_2O_5. Spot, add 5c.
Grainal: Vanadium Grainal No. 1, 87.5c; No. 6, 60c; No. 79, 45c; all fob Bridgeville, Pa., usual freight allowance.

TITANIUM ALLOYS

Ferrotitanium: (Ti 20-25%, Al 3% max., Si 4% max., C 0.10% max.). Eastern Zone, contract, ton lot, 2" x D, $1.35 per lb of contained Ti, less ton $1.40. (Ti 40-45%, Al 7% max., Si 4% max., C 0.10% max.). Ton lot $1.23, less ton $1.25; Central, add 4c for 20-25% Ti grade, and 2.1c for 40-45% grade; Western, add 13.5c for 20-25% Ti grade, and 7.2c for 40-45% grade. Freight allowed. Spot, add 5c.
Ferrotitanium, High-Carbon: (15-20%). Contract basis, per net ton, fob Niagara Falls, N. Y., freight allowed to destination east of Mississippi river and north of Baltimore and St. Louis, 6.8% C, $142.50; 3-5% C, $157.50.

TUNGSTEN ALLOYS

Ferrotungsten: (W 70-80%). Eastern Zone, contract, 10,000 lb W or more, $2.25 per lb of contained W; 2000 lb W to 10,000 lb W, $2.35; less than 2000 lb W, $2.47. Spot, add 2c.
Tungsten Powder: (W 98.8% min.). Eastern Zone, contract or spot, 1000 lb or more, $2.90 per lb of contained W; less than 1000 lb W, $3.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloy: (Zr 12-15%, Si 39-43%, Fe 40-45%, C 0.20% max.). Eastern Zone, contract, c.l., lump, bulk 6c per lb of alloy, c.l. packed 6.55c, ton lot 6.9c, less ton 7.25c; Central, add 0.25c for c.l. and 1.1c for l.c.l.; Western, add 0.6c for c.l. and 3.95c for l.c.l. Freight allowed. Spot, add 0.25c.
35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max.). Eastern Zone, contract, carload, lump, packed 18.4c per lb of alloy, ton lot 19.15c, less ton 20.4c; Central, add 0.6c for c.l. and 1.05c for l.c.l.; Western, add 3.05c for c.l. and 4c for l.c.l. Freight allowed. Spot, add 0.25c.

BORON ALLOYS

Ferroboron: (B 17.50% min., Si 1.50% max., Al 0.50% max., C 0.50% max.). Eastern Zone, contract, ton lots, 1" x D, $1.20 per lb of alloy, freight allowed. Less ton lots $1.30; Central, add 0.75c; Western, add 2.9c, freight allowed. Spot add 5c.
Borosil: (3 to 4% B, 40 to 45% Si). $6.25 per lb contained B, fob Philo, O., freight not exceeding St. Louis rate allowed.
Bortam: (B 1.5-1.9%). Ton lots, 45c per lb; smaller lots, 50c per lb.
Carbortam: (B 0.90 to 1.15%). Net ton to carload, 8c per lb, fob Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 50-60%, Mn 5% max., Si 8% max., C 0.5% max.). Eastern Zone, contract, ton lot, 2" x D, $2.50 per lb of contained Cb, less ton $2.55; Central, add 1.65c; Western, add 6.45c. Freight allowed. Spot, add 10c.
CMSZ Mixes: No. 4—Cr 45-49%, Mn 4-6%, Si 18-21%, Zr 1.25-1.75%, C 3-4.5%; No. 5—Cr 50-56%, Mn 4-6%, Si 13.50-16.0%, Zr 0.75-1.25%, C 3.50-5%). Eastern Zone, carload, 12 M x D, bulk 15.75c per lb of material, carload packed 16.5c, ton lot 17.25c, less ton 18c; Central, add 0.3c for c.l. and 1.1c for l.c.l.; Western, add 0.3c for c.l. and 3.05c for l.c.l. Freight allowed.
Silcax Alloy: (Si 35-40%, Ca 9-11%, Al 6-8%, Zr 3-5%, Ti 9-11%, Boron 0.55-0.75%). Eastern Zone, carload, packed, 1" x D, 37c per lb of alloy, ton lot 39c, less ton 41c; Central, add 0.3c for c.l. and 1.1c for l.c.l.; Western, add 0.3c for c.l. and 3.05c for l.c.l. Freight allowed.
SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx.). Eastern Zone, contract, carload, packed, ½" x 12 M, 14.3c per lb of alloy, ton lot 15.05c, less ton 15.8c; Central add 0.3c for c.l. and 1.1c for l.c.l.; Western, add 0.3c for c.l. and 3.05c for l.c.l. Freight allowed. Spot, add 0.25c.
Simanal: (Approx. 20% each Si, Mn, Al) Packed, lump, carload 9c, ton lots 9.25c, smaller lots 9.75c per lb alloy; freight not exceeding St. Louis rate allowed.
Ferrophosphorus: (17-19% based on 18% P content with unitage of $3 for each 1% of P above or below the base) Gross tons per carload fob sellers' works, with freight equalized with Rockdale, Tenn.; contract price $58.50, spot $62.25.
Ferromolybdenum: (55-75%). Per lb, contained Mo, fob Langeloth and Washington, Pa., furnace, any quantity 95.00c.

Red Metal Scrap and Silver Rise Further

Strength develops on active demand. Department of Commerce recommends continuation of tin controls

NEW YORK — W. A. Harriman, secretary of commerce, in his first quarterly report under the Secondary Decontrol Act 1947, said in part that it is the general policy to allocate as much tin plate as possible for export without undue adverse effect upon the domestic economy. He also recommended that present tin controls be continued. Silver and red metal scrap prices rose last week, other markets remaining steady.

COPPER—Demand for copper was brisk last week as leading producers opened books for December delivery. Custom smelters have very little, if any, tonnage available for delivery over the balance of this year and are booking January business cautiously pending a clearer indication of probable supplies in that month. Consensus in the trade is that supplies will be tight well into the first quarter.

Due to the re-entry into the scrap market by a leading refiner, buying prices rose 1/4 to 1/2-cent to the basis of 18.25c for No. 1 copper, 16.75c to 17.25c for No. 2 copper, 15.75c to 16.25c for light copper. Ingot makers lifted their buying prices to 17.50c for No. 1 copper scrap, 16.50c for No. 2 copper, 15.50c for light copper, and 10.50c for brass pipe. The primary market held unchaged.

BRASS INGOTS — Shipments of brass and bronze ingots increased to 19,025 tons in September from 18,589 in August, according to the Ingot Brass & Bronze Institute. This made the average monthly shipments 31,708 tons compared with 27,981 tons in the like 1946 period.

LEAD — Leading sellers encountered no difficulty in disposing of their daily quotas following the opening of December books. This was a continuation of the situation that has prevailed for many months.

Imports of refined lead by the United States amounted to 11,819 tons in September compared with 10,692 tons in August, according to the American Bureau of Metal Statistics. Of the September total, 7697 tons were from Mexico and 3956 tons from Canada. This brought the total for the first nine months to 113,872 tons compared with 71,357 tons in the like 1946 period.

ZINC — Demand for zinc has shown some improvement in the last few weeks, particularly from galvanizers, die casters and, to some extent, brass mills. Buying has been somewhat heavier for stockpiling, due in part to the approach of winter months when transportation difficulties may be encountered. A firmer price tone developed in the export market with sales reported at 10.12 1/2c, fas Gulf ports, for prime western and at 10.62½c for high grade zinc.

TIN—Under the title of "Recommendation" Mr. Harriman's report said: "There is not enough pig tin in sight to meet all essential requirements. Tin for the preservation of food should have first claim on available supplies. Without control, available supplies would flow to manufacturers on the basis of their ability to pay rather than the essentiality of their product to the public health and welfare. Furthermore, many small manufacturers would be unable to obtain minimum supplies and might be forced out of business."

The report also said that total United States supplies will fall far short of unrestricted requirements in the first six months of 1948. In that period, imported concentrates are expected to provide about 16,000 tons and imports of pig tin about 15,000 tons. In addition, about 12,000 tons are expected from all domestic secondary sources. Thus, the maximum tin supply in sight for that period is about 45,000 tons while demand of the consuming industries is estimated at 59,000 tons.

SILVER — Handy & Harman's official price of silver advanced 1 3/8-cents last week to 74.62½c an ounce. Strength of the market is attributed to the limited supplies of foreign silver that are available for prompt delivery coupled with active demand from silverware manufacturers and industrial consumers. Another factor is that the Mexican government took 6 million ounces in the third quarter for coinage purposes from producers in that country.

NONFERROUS METAL PRICES

Copper: Electrolytic, carlots 21.50c, delivered Conn.; Lake, 21.62½c del. Conn. Dealers may add ¾c for 5000 lb to carload; 1c 1000-4999 lb; 1½c, 509-999 lb; 2c 0-499 lb. Casting, nom., refinery, 20,000 lb or more; nom., less than 20,000 lb.

Brass Ingot: 85-5-5-5 (No. 115) 17.50c-18.00c; 88-10-2 (No. 215) 25.75-26.25c; 80-10-10 (No. 305) 21.50-22.00c; No. 1 yellow (No. 405) 13.75-14.50c; carlot prices, including 25c per 100 lb freight allowance; add ¼c for less than carloads.

Zinc: Prime western 10.50c, brass special 10.75c, intermediate 11.00c, E. St. Louis; high grade 11.50c, del., carlots. For 20,000 lb to carlots add 0.15c; 10,000-20,000 lb 0.25c; 2000-10,000 lb 0.4c; under 2000 lb 0.50c.

Lead: Common 14.80c-14.85c, chemical 14.90c, corroding 14.90c, E. St. Louis for carlots.

Primary Aluminum: 99% plus, ingots 15.00c del., pigs 14.00c del.; metallurgical 94% min. 13.50c del. Base 10,000 lb and over; add ½c 2000-9999 lb; 1c less through 2000 lb.

Secondary Aluminum: Piston alloy (No. 122 type) 14.00-14.50c; No. 12 foundry alloy (No. 2 grade) 13.75c; steel deoxidizing grades, notch bars, granulated or shot: Grade 1 (95-97½%) 14.50c; grade 2 (92-95%) 12.75c; grade 3 (90-92%) 12.00-12.25c; grade 4 (85-90%) 11.50-11.75c. Above prices for 30,000 lb or more; add ¼c 10,000-30,000 lb; ½c 5000-10,000 lb; ¾c 1000-5000 lb; 1¼c less than 1000 lb. Prices include freight at carload rate up to 75c per 100 lb.

Magnesium: Commercially pure (99.8%) standard ingots (4-notch, about 20 lb), 10,000 lb and over, 20.50c; 2000 to 9999 lb, 21.50c; 100 to 1999 lb, 22.50c. Extruded rounds, 12 inches long, 1.312 inches in diameter, less than 25 lb, 52.00c-56.00c; 25 to 99 lb, 42.00c-46.00c; 100 to 4000 lb, 35.00c-36.00c.

Tin: Prices ex-dock, New York in 5-ton lots. Add 1 cent for 2240-11,199 lb, 1½c 1000-2239, 2½c 500-999, 3c under 500. Grade A, 99.8% or higher (includes Straits), 80.00c; Grade B, 99.8% or higher, not meeting specifications for Grade A, with 0.05% max. arsenic, 79.85c; Grade C, 99.65-99.79% incl. 79.55c; Grade D, 99.50-99.64% incl., 79.40c; Grade E, 99-99.49% incl. 78.90c; Grade F, below 99% (for tin content), 78.70c.

Antimony: American bulk carlots fob Laredo, Tex., 99.0% to 99.8% and 99.8% and over but not meeting specifications below, 33.00c; 99.8% and over (arsenic, 0.05% max.; other impurities, 0.1% max.) 33.50c, effective as of Mar. 15. On producers' sales add ¼c for less than carload to 10,000 lb; ½c for 224-999 lb; add 2c for 223 lb and less; on sales by dealers, distributors, and jobbers add ½c, 1c, and 3c, respectively.

Nickel: Electrolytic cathodes, 99.9%, base sizes at refinery, unpacked 35.00c lb; 25 lb pigs produced from electrolytic cathodes 36.50c lb; shot produced from electrolytic cathodes 37.50c lb; "F" nickel shots or ingots for additions to cast iron 35.50c lb. Prices include import duty.

Mercury: Open market, spot, New York, $81-$84 per 76-lb flask.

Beryllium-Copper: 3.75-4.25% Be, $17 per lb contained Be.

Cadmium: Bars, ingots, pencils, pigs, plates rods, slabs, sticks, and all other "regular" straight or flat forms $1.75 lb, del.; anodes, balls, discs and all other special or patented shapes, $1.80.

Cobalt: 97-98%, $1.65 lb for 550 lb (keg) $1.67 lb for 100 lb (case); $1.72 lb under 100 lb.

Gold: U. S. Treasury, $35 per ounce.

Indium: 99.9%, $2.25 per troy ounce.

Silver: Open market, N. Y., 74.62½c, per ounce.

Platinum: $62-$65 per ounce.

Palladium: $24 per troy ounce.

Iridium: $80-$90 per troy ounce.

Rolled, Drawn, Extruded Products

Copper and brass products prices based on 21.50c, Conn., for copper. Freight prepaid on 100 lb or more).

Sheet: Copper 33.68c; yellow brass 29.63c; commercial bronze, 95% 33.72c, 90% 33.11c, red brass, 85% 31.99c, 80% 31.38c; best quality 30.64c; Everdur, Duronze, Herculoy or equiv., cold-drawn, 38.46c; nickel silver, 18%, 42.49c; phosphor bronze, grade A, 5%, 52.00c.

Rods: Copper, hot rolled 30.03c, cold drawn 31.03c; yellow brass, free cutting, 24.39c; commercial bronze, 95% 33.41c, 90% 32.80c; red brass, 85% 31.68c, 80% 31.07c; best quality 30.33c.

Seamless Tubing: Copper 33.72c; yellow brass 32.39c; commercial bronze 90% 35.52c; red brass 85% 34.65c, 80% 34.04c; best quality brass 33.05c.

Wire: Yellow brass 29.92c; commercial bronze, 95% 34.01c, 90% 33.40c; red brass, 85% 32.28c, 80% 31.67c; best quality brass 30.93c. **Copper Wire:** Bare, soft, fob eastern mills, carlots 26.92c, less carlots 27.42c; weatherproof, fob eastern mills carlots 27.60c, less carlots 28.10c; magnet, delivered, carlots 29.75c-31.13c, 15,000 lb or more 30.00c-31.38c, less carlots 30.50c-31.88c.

Aluminum Sheets and Circles: 2s and 3s flats, mill finish, base 30,000 lb or more, fob shipping point. Actual transportation charges (not to exceed lowest carload rail freight rate) are deducted on orders for domestic delivery of 500 lb or more of one product to one destination. Widths from 12 in. and diameters from 9 in. to indicated maximum sizes. Prices, cents per lb, effective Jan. 30, 1947.

B. & S. Gage	Max. Width or Diam.	Sheet Base	Circle Base
0.0249"-7	48"	23.70	26.20
8-10	48"	24.20	26.70
11-12	26"	24.70	27.50
13-14	26"	24.90	27.90
15-16	26"	25.10	28.20
17-18	26"	25.40	28.60
19-20	24"	25.70	29.00
21-22	24"	26.10	29.50
23-24	24"	26.60	30.20
25	24"	27.10	30.90
26	24"	27.80	31.90
27	24"	28.50	33.00
28	24"	29.20	33.70
29	24"	30.00	34.70
30	24"	30.80	35.80

Lead Products: Prices to jobbers: Sheets, full rolls, 140 sq ft or more, 18.25c; add per hundredweight, 25c, 80 to 140 sq ft; 50c, 20 to 80 sq ft; 75c, 10 to 20 sq ft and circles. Pipe: Full coils 17.50c; cut coils 17.75c. Lead Traps and Bends: List plus 42%.

Zinc Products: Sheet, 15.50c, fob mill, 36,000 lb and over. Ribbon zinc in coils, 14.50c, fob mill, 36,000 lb and over. Plates, not over 12-in., 13.50c; over 12-in., 14.50c.

Plating Materials

Chromic Acid: 99.75%, flake, fob Philadelphia, carloads, 21.00c; 5 tons and over 21.50c; 1 to 5 tons, 22.00c; less than 1 ton, 22.50c.

Copper Anodes: Base, 2000 to 5000 lb; fob shipping point, freight allowed: Flat untrimmed, 30.59c; oval, 30.09c; electrodeposited, 29.84c; cast, 29.59c.

Copper Carbonate: 52-54% metallic Cu, 50 lb bags, 26.50c.

Copper Cyanide: 70-71% Cu, 100-lb drums, 45.00c fob Cleveland.

Sodium Cyanide: 96-98%, ½-oz ball, in 100 or 200 lb drums, 1 to 400 lb, 16.00c, 500 lb and over, 15.00c, fob Cleveland; 1 cent less, fob Niagara Falls.

Nickel Anodes: Rolled oval, carbonized, carloads, 48.00c; 10,000 to 30,000 lb, 49.00c; 3000 to 10,000 lb, 50.00c; 500 to 3000 lb, 51.00c; 100 to 500 lb, 53.00c; under 100 lb, 56.00c; add 1 cent for rolled depolarized.

Nickel Chloride: 100-lb kegs, 22.00c; 275-lb bbls, 20.00c.

Tin Anodes: Bar, 1000 lb and over 92.50c; 500 to 1000 lb, 93.00c; 200 to 500 lb, 93.50c; less than 200 lb, 95.00c; ball, 1000 lb and over, 94.75c; 500 to 1000 lb, 95.25c; 200 to 500 lb, 95.75c; less than 200 lb, 97.25c, fob Sewaren, N. J.

Tin Chloride: Fob Grasselli, N. J., 625 lb bbls., price on application.

Sodium Stannate: To all consumers: in 200 or 500 lb drums, 49.50c; 100 lb, 50.50c; 50 lb, 55.00c; 25 lb, 57.50c.
To consumers other than automobile, radio and refrigerator makers: 1500 lb, 45.85c; 600 to 1400 lb, 48.50c.
To automobile, radio and refrigerator makers: 10,000 lb and over, 44.50c; 2000 to 9999 lb, 45.50c; 1000 to 1999, 46.50c; 600 to 999 lb, 48.50c.

Zinc Cyanide: 100-lb drums 36.00c, fob Cleveland; 35.00c, fob Niagara Falls.

Scrap Metals

BRASS MILL ALLOWANCES

(Based on 21.50c, Conn., for copper)
Prices for less than 15,000 lb fob shipping point. Add ¾c for 15,000-40,000 lb; 1c for 40,000 or more.

	Clean Heavy	Rod Ends	Clean Turnings
Copper	19.125	19.125	18.375
Yellow brass	15.125	14.875	14.250
Commercial Bronze			
95%	18.000	17.750	17.250
90%	17.500	17.250	16.750
Red brass			
85%	17.250	17.000	16.500
80%	16.875	16.625	16.125
Best Quality (71-79%)	16.125	15.875	15.375
Muntz Metal	14.125	13.875	13.375
Nickel silver, 5%	16.125	15.875	8.063
Phos. bronze, A, B	20.000	19.750	18.750
Naval brass	14.500	14.250	13.750
Manganese bronze	14.500	14.250	13.625

BRASS INGOT MAKERS BUYING PRICES

(Cents per pound, fob shipping point, carload lots)

No. 1 copper 17.50, No. 2 copper 16.50, light copper 15.50, composition red brass 13.50, auto radiators 10.50, heavy yellow brass 10.00, brass pipe 10.50.

REFINERS' BUYING PRICES

(Cents per pound, delivered refinery, carload lots)

No. 1 copper 18.25, No. 2 copper 16.75-17.25, light copper, 15.75-16.25, refinery brass (60% copper), per dry copper content less $5 smelting charge for brass analyzing 60 per cent or more, 12.625-13.625.

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots or more)

Copper and Brass: Heavy copper and wire No. 1 16.00, No. 2 15.00, light copper 14.00, No. 1 composition red brass 11.00, No. 1 composition turnings 10.00-10.50, mixed brass turnings 5.50-6.00, new brass clippings nom. 10.50-11.00, No. 1 brass rod turnings 9.00-9.50, light brass 5.00-5.50, heavy yellow brass 6.00-6.50, new brass rod ends 9.00-9.50, auto radiators, unsweated 8.50-9.00, cocks and faucets 8.00-8.25, brass pipe 8.00-8.25.

Lead: Heavy 11.50, battery plates 6.25-6.50, linotype and stereotype 12.25-12.50, electrotype 10.75-11.00, mixed babbitt 10.75-11.00, solder joints 15.50-16.00.

Zinc: Old zinc 5.00, new die cast scrap 3.50, old die cast scrap 2.00-2.50.

Tin: No. 1 pewter 50.00-52.00, block tin pipe 67.00-68.00, auto babbitt 40.00-42.00, No. 1 babbitt 40.00-43.00, siphon tops 40.00-42.00.

Aluminum clippings, 2S 8.00-8.50, old sheets 6.00-6.50, crankcases 6.00-6.50, borings and turnings 2.00-2.50, pistons, free of struts. 5.00-5.50.

Nickel: Anodes 16.00-17.00, turnings 12.50-13.00, rod ends 16.00-17.00.

Monel: Clippings 12.00-12.50, turnings 7.00-7.25, old sheets 10.00-10.50, rods 10.00-10.50, castings 9.00.

OPEN MARKET PRICES, IRON AND STEEL SCRAP

Prices are dollars per gross ton, including broker's commission, delivered at consumer's plant except where noted.

PITTSBURGH

No. 1 Heavy Melt. Steel	$40.00*
No. 2 Heavy Melt. Steel	40.00*
No. 1 Busheling	40.00*
Nos. 1, 2 and 3 Bundles	40.00*
Machine Shop Turnings	34.50-35.00
Mixed Borings, Turnings	34.50-35.00
Short Shovel Turnings.	36.00-37.00
Cast Iron Borings	35.00-36.00
Bar Crops and Plate	47.50-48.00
Low Phos. Steel	47.50-48.00
Elec. Furnace Bundles.	47.50-48.00
Heavy Turnings	39.50-40.50

*—Remote heavy melting scrap is coming into district at prices up to $47.

Cast Iron Grades

No. 1 Cupola	48.50-49.00
Charging Box Cast	43.00-44.00
Heavy Breakable Cast.	39.00-40.00
Unstripped Motor Blocks	44.00-45.00
Malleable	54.50-55.00
Brake Shoes	39.00-40.00
Clean Auto Cast	49.00-50.00
No. 1 Wheels	48.50-49.50

Railroad Scrap

No. 1 R.R. Heavy Melt.	42.50-43.00
R.R. Malleable	55.00-56.00
Axles	49.00-50.00
Rails, Rerolling	52.00-53.00
Rails, Random Lengths	49.00-49.50
Rails, 3 ft and under	50.00-51.00
Rails, 18 in. and under	52.00-53.00
Railroad Specialties	51.00-52.00
Uncut Tires	49.00-50.00
Angles, Splice Bars	50.00-51.00

CLEVELAND

No. 1 Heavy Melt. Steel	$39.50-40.50
No. 2 Heavy Melt. Steel	39.50-40.50
No. 1 Busheling	38.70-39.50
Nos. 1 & 2 Bundles	39.50-40.50
Machine Shop Turnings	33.00-33.50
Mixed Borings, Turnings	33.00-35.00
Short Shovel Turnings.	33.00-35.00
Cast Iron Borings	33.00-35.00
Bar Crops and Plate	43.00-44.00
Punchings & Plate Scrap	43.00-44.00
Heavy Turnings	38.50-39.50
Alloy Free Turnings	35.00-37.00
Cut Structurals	45.00-46.00

Cast Iron Grades

No. 1 Cupola	50.00-52.00
Charging Box Cast	45.00-46.00
Stove Plate	48.00-48.50
Heavy Breakable Cast.	45.00
Unstripped Motor Blocks	48.00-49.00
Malleable	60.00-62.00
Brake Shoes	44.00
Clean Auto Cast	52.00-52.50
No. 1 Wheels	48.00
Burnt Cast	44.00-45.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	42.00-47.00
R.R. Malleable	60.00-62.00
Rails, Rerolling	52.00
Rails, Random Lengths	50.00-51.00
Rails, 3 ft and under	52.00-55.00
Cast Steel	50.00-52.00
Railroad Specialties	50.00-52.00
Uncut Tires	43.00-43.50
Angles, Splice Bars	50.00-52.00

VALLEY

No. 1 Heavy Melt. Steel	$40.00*
No. 2 Heavy Melt. Steel	40.00*
No. 1 Bundles	40.00*
Machine Shop Turnings	33.00-34.00
Short Shovel Turnings.	34.00-35.00
Cast Iron Borings	34.00-35.00
Low Phos.	47.50-49.50

* Plus freight.

Railroad Scrap

No. 1 R.R. Heavy Melt.	42.00-47.50

MANSFIELD

Machine Shop Turnings	36.50-37.50
Short Shovel Turnings.	36.50-37.50

CINCINNATI

No. 1 Heavy Melt. Steel	$39.50
No. 2 Heavy Melt. Steel	39.50
No. 1 Busheling	39.50
No. 1 Bundles	39.50
No. 2 Bundles	39.50
Machine Shop Turnings	33.50
Mixed Borings, Turnings	32.50
Short Shovel Turnings.	35.50
Cast Iron Borings	34.50

Cast Iron Grades

No. 1 Cupola Cast	48.00
Charging Box Cast	40.00
Heavy Breakable Cast.	42.00
Stove Plate	40.00
Unstripped Motor Blocks	39.00
Brake Shoes	36.00
Clean Auto Cast	47.00
Drop Broken Cast	50.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	42.00
R.R. Malleable	58.00
Rails, Rerolling	48.50
Rails, Random Lengths	46.50
Rails, 18 in. and under	51.00

DETROIT

(Dealers buying prices, fob shipping point)

No. 1 Heavy Melt. Steel	$34.50-35.00
No. 1 Busheling	34.50-35.00
Nos. 1 & 2 Bundles	34.50-35.00
No. 3 Bundles	34.50-35.00
Machine Shop Turnings	28.50-29.00
Mixed Borings, Turnings	28.50-29.00
Short Shovel Turnings.	29.50-30.00
Cast Iron Borings	29.50-30.00
Punchings & Plate Scrap	40.00-41.00

Cast Iron Grades

No. 1 Cupola Cast	45.00-46.00
Heavy Breakable Cast.	38.00-39.00
Clean Auto Cast	45.00-46.00

BUFFALO

No. 1 Heavy Melt. Steel	$41.50-43.50
No. 2 Heavy Melt. Steel	39.50-40.50
No. 1 Busheling	39.50-40.50
No. 1 & 2 Bundles	39.50-40.50
Machine Shop Turnings	33.00-34.00
Mixed Borings, Turnings	33.00-34.00
Cast Iron Borings	33.00-34.00
Short Shovel Turnings.	34.50-35.50
Low Phos.	44.50-45.50
Elec. Furnace Bundles.	44.00-46.00

Cast Iron Grades

No. 1 Cupola	44.00-45.00
Heavy Breakable Cast.	38.00-39.00
Malleable	52.00-55.00
No. 1 Wheels	44.00-46.00

Railroad Scrap

Rails, 3 ft. and under.	48.00-51.00
Railroad Specialties	48.00-49.00

PHILADELPHIA

No. 1 Heavy Melt. Steel	$42.00-43.00
No. 2 Heavy Melt. Steel	42.00-43.00
No. 1 Busheling	42.00-43.00
No. 1, No. 2 Bundles	42.00-43.00
No. 3 Bundles	40.00-41.00
Machine Shop Turnings	33.50-34.00
Mixed Borings, Turnings	33.50-34.00
Short Shovel Turnings.	35.00
Bar Crop and Plate	46.50-47.50
Punchings & Plate Scrap	46.50-47.50
Cut Structurals	46.50-47.50
Elec. Furnace Bundles.	44.50-45.50
Heavy Turnings	43.00-44.00
No. 1 Chemical Borings	39.00-40.00

Cast Iron Grades

No. 1 Cupola Cast	49.00-50.00
No. 1 Machinery Cast.	52.00-53.00
Charging Box Cast	49.00
Heavy Breakable Cast.	49.00
Unstripped Motor Blocks	46.00-47.00
Malleable	58.00-60.00
Clean Auto Cast	51.00-52.00
No. 1 Wheels	50.00

NEW YORK

(Dealers buying prices, fob shipping point)

No. 1 Heavy Melt. Steel	$38.00
No. 2 Heavy Melt. Steel	38.00
No. 1 Busheling	38.00
Nos. 1 & 2 Bundles	38.00
No. 3 Bundles	36.00
Machine Shop Turnings	29.00-30.00
Mixed Borings, Turnings	29.00-30.00
Short Shovel Turnings.	31.00-32.00
Punchings & Plate Scrap	40.00
Cut Structurals	40.00
Elec. Furnace Bundles.	40.00

Cast Iron Grades

No. 1 Cupola Cast	43.00-44.00
Charging Box Cast	43.00-44.00
Heavy Breakable	43.00-44.00
Unstripped Motor Blocks	40.00
Malleable	54.00-55.00

BOSTON

(Fob shipping point)

No. 1 Heavy Melt. Steel	$31.00-32.00
No. 2 Heavy Melt. Steel	29.00-30.00
No. 1 Bundles	30.00-31.00
No. 1 Busheling	29.00-30.00
Machine Shop Turnings	26.00-27.00
Mixed Borings, Turnings	27.00-28.00
Short Shovel Turnings.	27.00-28.00
Bar Crops and Plate	32.00-33.00
Punchings & Plate Scrap	32.00-33.00
Chemical Borings	28.00-29.00

Cast Iron Grades

No. 1 Cupola Cast	42.00-44.00
Charging Box Cast	38.00-39.00
Heavy Breakable Cast.	38.00-39.00
Stove Plate	38.00-39.00
Unstripped Motor Blocks	36.00-37.00
Clean Auto Cast	40.00-42.00

CHICAGO

No. 1 Heavy Melt. Steel	$38.50-39.00
No. 2 Heavy Melt. Steel	38.50-39.00
Nos. 1 & 2 Bundles	38.50-39.00
No. 3 Bundles	36.50-37.00
Machine Shop Turnings	33.50-34.00
Mixed Borings, Turnings	33.50-34.00
Short Shovel Turnings.	35.50-36.00
Cast Iron Borings	34.50-35.00
Bar Crops and Plate	41.00-41.50
Cast Steel	41.00-41.50
Punchings	44.50-45.00
Elec. Furnace Bundles.	39.50-40.00
Heavy Turnings	38.00-38.50
Cut Structurals	43.50-44.00

Cast Iron Grades

No. 1 Cupola Cast	48.00-50.00
Malleable	48.00-49.00
Clean Auto Cast	48.00-50.00
No. 1 Wheels	45.00-46.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	40.75-41.25
Malleable	62.00-63.00
Rails, Rerolling	55.00-56.00
Rails, Random Lengths	49.00-50.00
Rails, 3 ft and under	51.00-52.00
Rails, 18 in. and under	52.00-53.00
Railroad Specialties	49.00-50.00
Angles, Splice Bars	50.00-51.00

ST. LOUIS

No. 1 Heavy Melt. Steel	$39.00-40.00
No. 2 Heavy Melt. Steel	37.00-38.00
Machine Shop Turnings	27.00-30.00
Short Shovel Turnings.	33.00-34.00

Cast Iron Grades (Fob shipping point)

No. 1 Cupola Cast	42.00-45.00
Charging Box Cast	40.00-42.00
Heavy Breakable Cast.	35.00-36.00
Brake Shoes	40.00-41.00
Clean Auto Cast	42.00-45.00
Burnt Cast	39.00-40.00

Railroad Scrap

R.R. Malleable	58.00-60.00
Rails, Rerolling	48.00-49.00
Rails, Random Lengths	44.00-46.00
Rails, 3 ft and under	48.00-50.00
Uncut Tires	43.50-44.50
Angles, Splice Bars	46.00-47.00

BIRMINGHAM

No. 1 Heavy Melt. Steel	$34.00-35.00
No. 2 Heavy Melt. Steel	34.00-35.00
No. 1 Busheling	34.00-35.00
Nos. 1 & 2 Bundles	34.00-35.00
No. 3 Bundles	31.00
Long Turnings	34.50
Short Shovel Turnings.	26.00-27.00
Cast Iron Borings	25.00
Bar Crops and Plate	38.50
Cut Structurals	38.50

Cast Iron Grades

No. 1 Cupola Cast	41.00
Stove Plate	39.00
No. 1 Wheels	36.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	37.00
R.R. Malleable	42.50
Axles, Steel	39.00
Rails, Rerolling	41.00
Rails, Random Length.	39.00
Rails, 3 ft and under	41.00
Angles and Splice Bars.	41.00

SAN FRANCISCO

No. 1 Heavy Melt. Steel	*$22.00
No. 2 Heavy Melt. Steel	*22.00
No. 1 Busheling	*22.00
Nos. 1 & 2 Bundles	*22.00
No. 3 Bundles	*17.00
Machine Shop Turnings	*12.50
Bar Crops and Plate	22.00
Cast Steel	22.00
Alloy Free Turnings	12.50
Cut Structurals	22.00
Tin Can Bundles	17.00

Railroad Scrap

Axles	29.00
Rails, Random Lengths	23.50
Uncut Tires	30.50

*Fob California shipping point.

SEATTLE

No. 1 Heavy Melt. Steel	$24.00
No. 2 Heavy Melt. Steel	24.00
No. 1 Busheling	24.00
Nos. 1 & 2 Bundles	22.00
No. 3 Bundles	22.00
Machine Shop Turnings	14.50
Mixed Borings, Turnings	14.50
Punchings & Plate Scrap	24.50
Cut Structurals	24.50

Cast Iron Grades

No. 1 Cupola Cast	27.50
Charging Box Cast	22.50
Heavy Breakable Cast.	21.50
Stove Plate	23.00
Unstripped Motor Blocks	21.50
Malleable	27.50
Brake Shoes	27.50
Clean Auto Cast	27.50
No. 1 Wheels	24.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	22.00
Railroad Malleable	30.00
Rails, Random Lengths	21.50
Angles and Splice Bars	23.00

LOS ANGELES

No. 1 Heavy Melt. Steel	$25.00
No. 2 Heavy Melt. Steel	25.00
Nos. 1 & 2 Bundles	25.00
Machine Shop Turnings	16.00
Mixed Borings, Turnings	15.50-16.00
Punchings & Plate Scrap	28.00
Elec. Furnace Bundles.	28.00

Cast Iron Grades

No. 1 Cupola Cast	35.00-36.00

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1. The vertically operating tramper door which means continuous operation in that a charge can be loaded while a bundle is being compressed.
2. The Harris 4-A baler is equipped throughout with micromatic honed cylinders which means perfect concentricity and extremely close tolerances. This greatly increases the life of all packings as well as the life of the machine itself and gives a smooth operation.
3. The Harris 4-A baler is equipped with Vickers vane type rotary pumps and outstanding control arrangement.

The Harris 4-A baler located adjacent to your railroad siding is easily adaptable to conveyor equipment for delivering scrap to the press and the finished bundles to the car with an absolute minimum of labor. This reduces the production cost of bundles amazingly, and means: 1—Reduction in labor cost; 2—Increased profits; 3—Safety; 4—Cleanliness and Orderliness in your plant.

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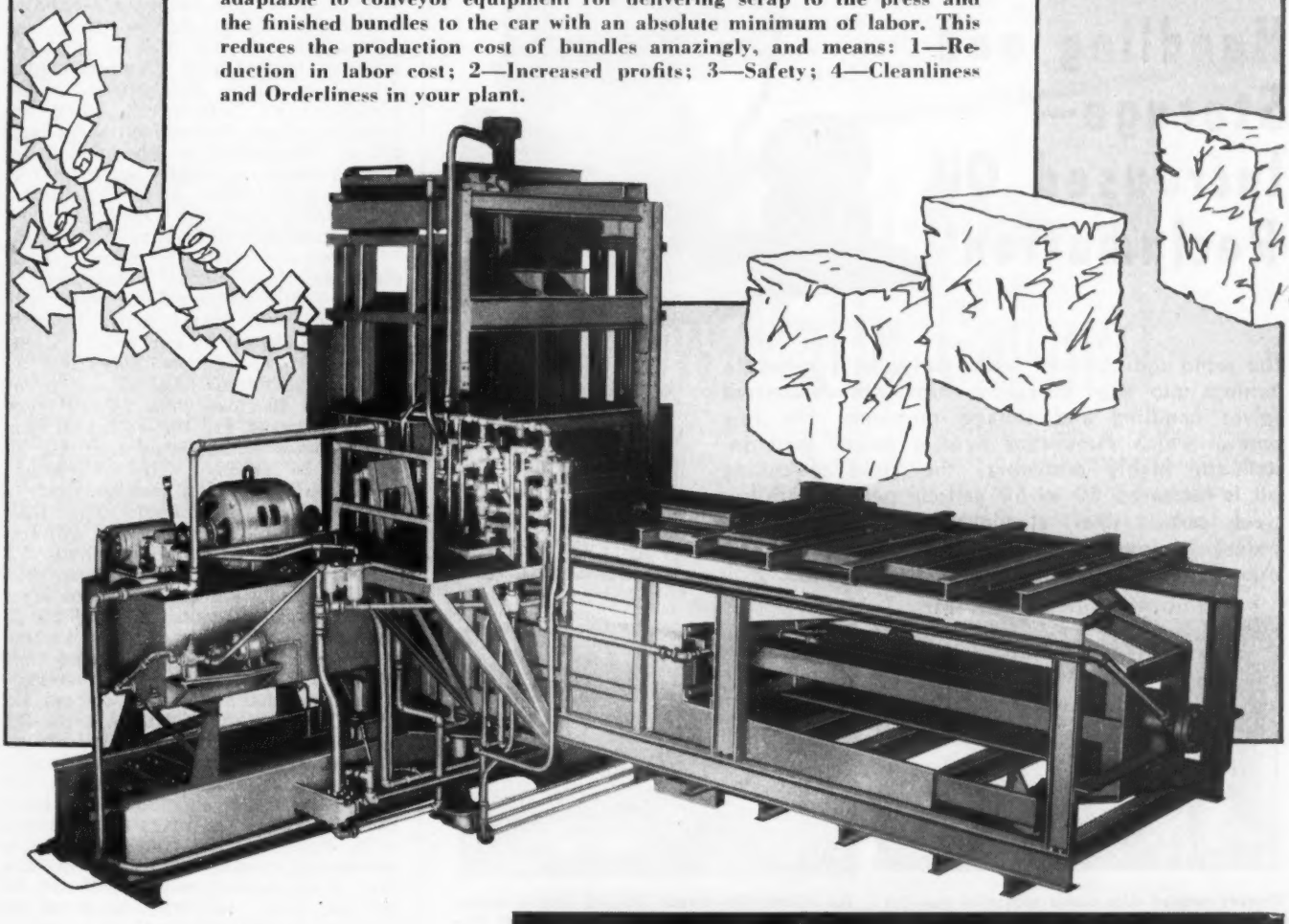

Harris Scrap Metal Baling Press Model 4 A

HARRIS FOUNDRY & MACHINE CO.

Reclamation Engineers Since 1889

CORDELE, GEORGIA

Sheets, Strip . . .

Some midwestern producers reduce allotments to eastern consuming areas

Sheet Prices, Page 168

New York — While first quarter sheet quotas in general will be about on a parity with those for the current period, at least one or two midwestern producers have reduced their allotments slightly to district offices here. This will be reflected in the quotas being set up for their customers. Whether this marks a further withdrawal from the eastern market because of higher freight rates and the likelihood of still higher rates to come, possibly by around March 1, is not clear. Meanwhile, production continues high, being limited only by raw material supply, particularly scrap and pig iron.

Galvanized and cold-finished sheets are in most stringent supply, although hot-rolled sheets are almost as stringent. Consumers, particularly those who sprung up during the war and older companies which have added new lines, are having a severe struggle, with an increasing number dropping by the wayside. Under the circumstances, gray market activities continue to flourish.

With New York state interstate rates having finally followed the interstate increase of 10 per cent on carlots, the New York delivered price on cold-rolled sheets, based on Buffalo, has been advanced from 3.96c per pound to 4.001c.

Pittsburgh — Order acceptance by leading producers of flat rolled steel for the first quarter indicates little change in demand pattern. No letup is noted in pressure for delivery from any consumer group. Continued unbalanced supply-demand situation in sheets and strip is not expected to be remedied until the second half of 1948 at the earliest. The relatively large number of "hardship" cases among customers whose operations are threatened by the lack of steel is an indication of this situation.

October output established a new monthly record. For example, the 80-inch continuous strip mill at Carnegie-Illinois Steel Corp.'s Irvin Works rolled 166,338 net tons last month compared with the mill's previous record of 153,784 tons, established last January. To meet the critical demand for special alloy and silicon steel sheets, Carnegie has commenced rolling these items at its Vandergrift plant on a high-speed 54-inch cold-reduction mill which formerly was used in rolling carbon steel sheets at the company's Irvin Works. Coils now being cold-reduced on this mill are shipped from the company's hot-strip mill at Irvin. It appears logical that hand-mill production of silicon sheets will be discontinued at Vandergrift when demand slackens. Galvanized sheet output at Vandergrift is scheduled to be concentrated eventually at Irvin following installation of a continuous galvanizing line, not expected to be ready until late next year.

Boston — With the exception of stainless, first quarter allocations of sheets will frequently cover only February and March with January largely taken up by carryovers. Cold-rolled strip producers operating on monthly schedules have allocated for February or close to a 75-day lead-time. Demand for flat-rolled in carbon grades is unabated and far in excess of supply with indications some mills will ship less tonnage to consumers in December. The John Hancock building addition will require 200 tons of stainless, mostly for the tower; two mills will furnish this.

Chicago — While demand for steel sheets continues unabated, and far in excess of available supplies from mills, reports are heard of substantial tonnages available from gray market sources. Offering prices appear to range from $185 to $265 a ton. As nearly as can be ascertained, such offerings are explained as mill tonnage originally intended for export, but which "now can be made available." Early start of deliveries is promised, with shipments to continue over a number of months. Mills feel certain that gray market sellers will not be able to make deliveries on much of this material for steelmakers are alert to diversion of export tonnage to domestic and would speedily cut off such supply.

Birmingham—Sheets are being produced at consistently high volume here but supplies do not improve. Some allocation of sheets for jobber distribution in the fourth quarter is still undelivered and is not likely to

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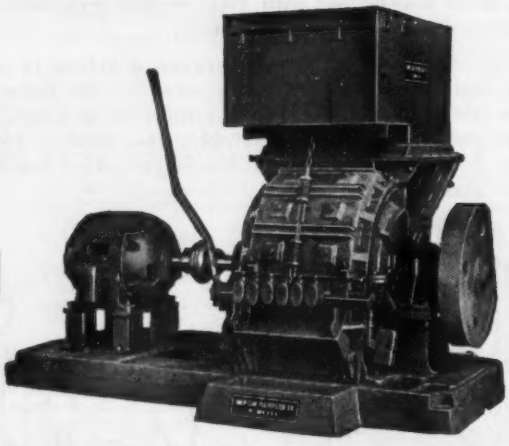

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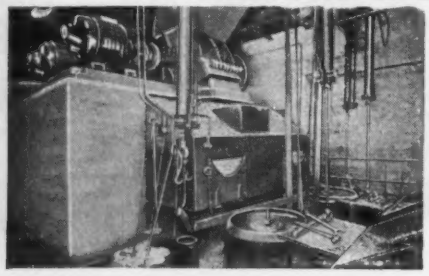

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show up except in small quantities. Strip is in better supply and production is tapering off.

St. Louis—Sheet producers continue optimistic they will be abreast of orders by Jan. 1. Books have been closed 10 months or more to achieve this objective and some customers recently have been asked to revise orders downward or take stock items. Demand remains high with inquiries from outside territories as numerous as in the initial postwar period. Pressure for deliveries to farm equipment people is especially strong. All types of consumers are pushing for positions in first quarter rolling schedules. Effective Jan. 1, or whenever backlog orders are filled, Granite City Steel Co. will cease making hot-rolled sheets and plates to concentrate on light gage cold-rolled products which are in greatest demand. By then the company will have in operation a new cold mill which is a part of a $7 million expansion project. Also included are a new tempering mill, annealing deparment, pickling and shearing lines and an electrolytic cleaning line. Cold rolling capacity will be 20,000 tons a month, approximately double the former capacity. A company spokesman said its hot rolled sheet and plate production has not been profitable for some time and that the changeover has been under consideration several months. Plate output since the war has been less than 20 per cent of total finished steel tonnage.

Plates . . .

Plate Prices, Page 169

New York—Production difficulties continue to restrict plate supply. Some eastern mills are still unable to get their average rolling schedules up to more than three days a week, due to shortage of pig iron and scrap, particularly pig iron. As as result some producers notwithstanding conservative scheduling, now doubt if they will be much further ahead on their arrearages at the turn of the year than they were at the beginning of this quarter. Significant is the fact that one large producer of plates and other products ranks plates, in point of stringency, on practically the same basis with sheets. Strikes at some of the local district shipyards move into their sixth month, but despite lack of plate demand from these sources local sellers are confronted with far more specifications than they are able to meet.

Boston—The spread in plate prices has widened to $30 a ton between the highest and lowest prices, delivered Boston. There is a shortage, notably in lighter carbon welding quality grades and even the top prices in the range are not bringing more tonnage. Selectivity in acceptance of orders is not relaxed and with schedules filled into next year with substantial carryovers indicated, some producers are reluctant to book additional volume in any grade. Tank shops are short of steel and weldment fabricators are again low, buying from warehouses in more cases. Tunnel work in Boston, for which the general contract has been placed, takes 500 tons of plates.

Philadelphia — Plate makers are meeting with disappointing results in their efforts to step up production. Because of the shortage of scrap and pig iron, few jobbers, if any, have been able to increase their rollings to more than four days a week, and some have not been able to average better than three days a week. Hence, their yearend carryover is going to be heavy. Some producers predict their rolling of new specifications in the first quarter will be about on a parity with that of the present period. One midwestern mill, which has been turning out some strip plate for miscellaneous purposes, is planning to confine output after the first of the year to freight car tonnage only and to turn out no more of this tonnage than it is now doing.

Seattle — Plates continue in short supply and plants are limited in bidding new jobs due to the amount of materials available. Railroads are reported in the market for their annual supply of tie plates and mills in this area expected contracts to be placed soon.

Fluorspar . . .

Fluorspar Prices, Page 170

Cleveland—Sellers of fluorspar advanced prices about $2 a net ton last week to the basis of $35, fob shipping point in Illinois and Kentucky, for effective calcium fluoride content of 70 per cent or more; $32 for the less than 60 per cent grade.

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Steel Bars . . .

Moderate upturn develops in cold-finished and alloy bar bookings

Bar Prices, Page 168

Pittsburgh — Alloy bar sellers report a moderate upturn in new orders, attributed to better balanced inventories among leading consumers, although backlogs remain relatively insignificant in comparison with those for carbon steel items. Cold finishers similarly have experienced improvement in order volume, although as in the case of alloys relatively prompt deliveries are still available.

Carbon bar sellers have experienced some relief from reduced requirements of cold finishers in recent months, but demands from other sources have more than taken up the slack. Some easing in order volume for large carbon rounds has been reported for some time now, but openings in rolling schedules are quickly utilized for production of tube rounds, grader blades, etc.

Boston — Cold-finished carbon and alloy bar supplies are in balance with demand. While some improvement in supply of hot-rolled carbon bars is developing, some producers will have nearly four weeks carryover at the year end and this has tended to delay first quarter allocations. There are still consumers hard-pressed for hot-rolled, notably bolt and nut shops, where want of inventory balance is frequently the most serious angle. Most forge shops could use more bars, although those working alloys are in fair shape. Postwar consumption of alloys in district forge shops has been slightly higher than before. Flats in all grades are not too plentiful.

New York — Advance in New York intrastate rates of 10 per cent, in line with the increase in interstate rates Oct. 13, has stepped up the New York city delivered price on hot carbon bars, based at Buffalo, from 3.31c to 3.351c.

Small and medium sizes of hot carbon bars continue in pressing demand, and in general first quarter quotas, which are now being set up, show little variation from the current quarter. New rolling facilities may ease the situation after the turn of the year, but this is not reflected in present allocations. Small and special sizes of cold drawn carbon bars are in fairly brisk demand, but careful shopping usually brings out supplies for delivery within two to three months. Hot alloy bars are still available within four to five weeks and cold alloy material within five to seven weeks.

Philadelphia—Hot-rolled carbon bars remain in tight supply, particularly in the small sizes. However, the overall picture for next year is somewhat more encouraging than in the flat-rolled products. Some producers believe they will be able to supply a little more tonnage in the first quarter than they are now doing; others doubt they will be able to do any better. General opinion is that with demand still in excess of supply any betterment that may develop will be scarcely noticeable.

Cold-drawn bars and alloys are in free supply, with the latter available for shipment within four to five weeks on the hot grades and five to seven weeks on the cold grades. Cold-finished carbon bars can be had for delivery within six to seven weeks, except on the smaller sizes, on which most sellers are unable to promise delivery within two to three months.

Seattle — Rolling mill operations continue at capacity, demand for both reinforcing and merchant bars showing no decline. Plants are refusing business daily.

Tin Plate . . .

Tin Plate Prices, Page 169

Pittsburgh — Tin plate output this quarter is not expected to record any significant increase over preceding period. Outlook for a better supply-demand relationship through first half of next year is clouded by expected continued tight restrictions placed on production due to inadequate pig tin and steel supplies. Necessity for control over distribution of tin is attributed to war-caused disruption in normal sources of supply. Despite gradual increase in Far Eastern production, the supply of tin is far below estimated world requirements. Reflecting this situation, consideration is being given the limitation of end use applications for nonfood containers and for beer and coffee cans. Can companies' tin plate inventories are well below satisfactory levels, while producers' inventories are said to be practically depleted.

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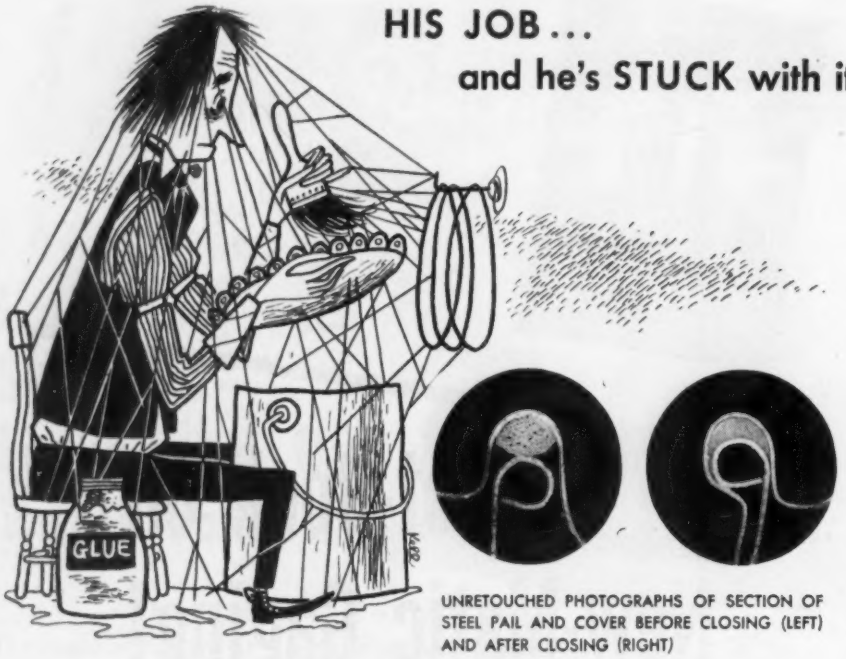

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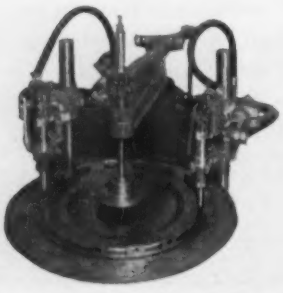

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Wire . . .

Wire Prices, Page 169

Pittsburgh — Sellers are unable to detect any sign of easing in demand through almost the entire range of manufacturers' and merchant wire products. Jobbers' stocks of nearly all merchant wire products remain unbalanced and well below normal volume. The unbalanced demand-supply situation in nails is becoming more acute despite industry's efforts to step up output to meet augmented needs for housing construction. This condition is expected to be accentuated next year due to scheduled increase in the construction goal of 1 1/2 million family units. Despite some moderate improvement in output throughout October and prospects of maintaining this high production pace throughout the remainder of this year, most sellers do not expect any easing in pressure for prompt shipment.

An independent producer advanced galvanized, standard and cement coated nails, polished and galvanized staples, $15 per ton, effective Nov. 6; also farm and poultry fence, $10 a ton. The new prices for this interest are $5.00 per 100 pounds for standard and cement coated nails and polished and galvanized staples, $4.75 for galvanized nails, and column 101 for fence. Another interest increased its wire rod price $10 a ton to a new base of $3.30 per 100 pounds.

Boston—First quarter capacity for production of high carbon specialties is filling and there will be considerable carryover on some grades. Consumers of low carbon wire are operating with low inventories as a rule, although there is a slight improvement in rods, both high and low carbon. Heavy demand holds for clock spring stock and cold heading wire, with screw manufacturers pressing for tonnage. Valve spring wire production is now about in balance with consumption and users are easing pressure for delivery slightly. Mounting demand is noted for tire cord wire, although stranding equipment is a bottleneck. Among the easy grades is music wire, some sizes being available from stock.

Birmingham—Wire shortages, in all categories, remain acute. One of the largest jobbers in the South reports no letup in the tight situation in nails, wire fencing and baling wire, allocations being only a fraction of normal requirements. Considerable letup is reported, however, in current wire demand from agricultural sources since advent of the rainy season.

Tubular Goods . . .

Tubular Goods Prices, Page 169

Boston — Pipe mills allocating on a quarterly basis have established unchanged quotas for distributors in first quarter while those scheduling monthly follow much the same line. Suppliers of steel pipe are under pressure from all directions, notably utilities seeking larger tonnage for extensions and replacements next year. Considerable expansion of this nature has been delayed in 1947 because pipe was not available. Inventories with distributors are low and pipe fabricating shops are seeking more tonnage to cover against previous commitments which in some cases are in excess of allocations, although the latter are sometimes heavier than prewar.

Pittsburgh — Tubular goods producers do not expect the Marshall Plan will involve much pipe for export, but any steel taken from integrated producers will reduce the supply available for pipe fabrication. Sellers report no letup in demand, with the possible exception of stainless and alloy mechanical pressure tubing and, to a lesser degree, for API drill pipes. Pressure for shipment of standard pipe and oil country goods is not expected to ease for months to come. It is encouraging to note output of most pipe and tubular items continues at practical capacity. Indicative of the industry's effort to satisfy the huge pentup demand for pipe is the new record of 25,690 tons produced during October on the No. 1 seamless mill of National Tube Co.'s National Works at McKeesport, Pa.

Power Piping Division of Blaw-Knox Co. has received a $1,250,000 contract from the city of Los Angeles for the supply and installation of all piping to be used in three new electrical power generating units of high-pressure, steam turbine type. Alloy steel pipe will be used to accommodate operating pressures of 900 to 1050 pounds and steam temperature of 950 degrees F.

St. Louis — Pressure on pipe suppliers in this area has taken another jump, although deliveries already are

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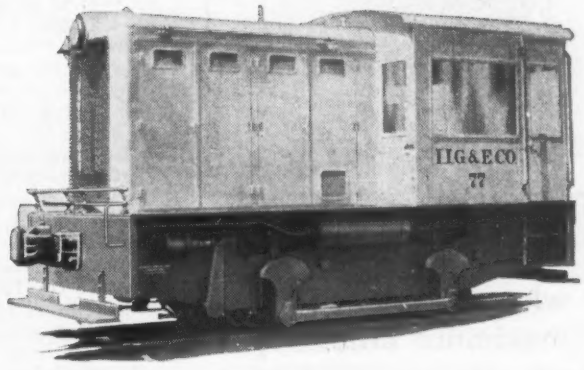

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10 months behind. Farm and oil industry demands are on the increase and delivery schedules were set back by some health emergency shipments made to the Florida hurricane disaster area. Ingots are a serious bottleneck which is expected to continue six to eight months. A seasonal easing in housing pipe demand has not shown up and there are reports of used pipe being diverted to such construction.

Seattle — Cast iron pipe market is inactive but new projects are expected to be up for figures in December. Agencies are seriously handicapped, with mills overloaded, deliveries uncertain and inventories exhausted. Cast iron shipments are based on an average of 18 months, other types are specifying about 10 months. This situation has diverted considerable tonnage from cast iron to steel pipe.

Scrap . . .

Scrap Prices, Page 174

Pittsburgh — Up to late last week, mills were still out of the market for open hearth grades of scrap. It is reported producers would re-enter the market if they could obtain tonnages at the $40 level for heavy melting. However, brokers continue to shy away from accepting orders at that price while in some instances they are having difficulty in buying scrap at $42.50 to cover $43 orders. Some mills continue to accept scrap from customers at market quotations or under on a contract-negotiated price which means, in effect, that considerable remote scrap continues to be shipped here at prices up to $47 a ton. Despite the fact that a large tonnage is scheduled to be shipped this month at higher price levels, it is questionable how long mills can remain out of the market. A steady flow of scrap to steel mills must be maintained if present record steel production pace is to be sustained. Need for scrap remains acute and prices could easily rise to higher levels should mills reenter the market at one time.

Market interests are watching the outcome of the latest Pennsylvania railroad offering, on which bids are due Nov. 10. Most of the heavy melting steel on the last list was allocated at around $43, although some tonnage was sold as high as $46.

Philadelphia — While some consumers of steelmaking scrap are marking time, following recent purchases, others are still buying modest amounts, paying as high as $43, delivered. Scrap is flowing more freely and consumers are able to increase inventories slightly. However, they still have a long way to go in building up stocks to the volume desired for winter operations. Fundamentally, the market continues strong, with various grades somewhat higher than a week ago, despite caution on the part of all interests. A notable exception is the low phos grades, which remain unchanged. Strength is still reflected in cast scrap, with advances in practically all items.

The five major steelmaking grades are now $42 to $43, delivered; No. 3 bundles, $40 to $41; machine shop turnings, $33.50 to $34; electric furnace bundles, $44.50 to $45.50; heavy turnings, $43 to $44; No. 1 chemical borings, $39 to $40. No. 1 cupola cast is higher at $49 to $50, delivered; No. 1 machine cast $52 to $53; charging box and heavy breakable cast, $49; unstripped motor blocks, $46 to $47; clean auto cast, $51 to $52; No. 1 wheels, $50. Malleable is steady at $58 to $60.

New York — Scrap brokers' buying prices held unchanged last week, except for short shovel turnings, on which prices were off slightly at a spread of $31 to $32, fob shipping point. The major steelmaking grades were quoted $38. Movement of scrap is fairly brisk, principally against orders placed two or more weeks ago. Meanwhile, the market is largely in a test period, with most consumers marking time. They are in a more comfortable supply position and, while they still need tonnage to build up winter reserves, they are anxious not to do anything that would force the market higher than its already high levels.

Boston—Except for some buying to cover old orders at prices admittedly higher than what may be expected when new purchasing is resumed, activity in steelmaking scrap is at a standstill. Brokers without old orders are marking time. Meanwhile supply of steel scrap is limited. Anticipating higher melt with increased capacity, several cast consumers have built up inventories substantially.

Chicago — Mills continue to adhere to their buying price of $39 a ton, delivered, for heavy melting steel and while they are able to acquire a fair tonnage at this figure the market is firm. It is obvious sellers are withholding scrap from sale until they can gain a clearer picture of the future course of the market. Consensus is that no great volume was involved in the recent buying at $43, consequently mills need to keep tonnage flowing to sustain steelmaking at its present high level. Within another two weeks shipments against high priced orders will have been completed.

Cleveland — Influence of the current policy of most steel mills of refusing to pay more than $39.50 on new orders for No. 1 heavy melting steel is reflected in a decline in prices offered by brokers to dealers. While most of the present activity is that of brokers working to complete deliveries on old orders, one mill bought scrap last week at its "hold-the-line" offering of $39.50 for No. 1 heavy melting. Possibly reflecting the effects of lowered steel production in August and September and resultant decreased deliveries of steel to consumers, the flow of scrap from industrial plants here is now showing a slight decline, one dealer reported. In an effort to obtain scrap, one steel producer is shipping steel only to customers who return their industrial scrap to the mill.

While some mills were showing resistance to high prices, one consumer in the Valley last week was paying $49.50 delivered for low phos.

Buffalo — Although the scrap market remains deadlocked, prices were heading higher last week as mill bids were increased $1.25 a ton to $39.25 for No. 2 heavy melting and bundles. Dealers, however, are not in a position to accept orders at the raised bid which is still short of the prevailing range of $39.50 to $40.50 for No. 2 material. Dealers say they are incurring losses by being forced to pay within the quoted range to

cover old commitments negotiated on the basis of $37 to $38 for No. 2 scrap. Fresh outside buying, notably by Pittsburgh consumers, at recently advanced prices in the midstate area, tended to bolster the local market and also squelch reports of pronounced weakness in other centers.

Detroit — Blowing first hot, then cold, the scrap market turned softer here last week, as mills held to their formula buying price of $37, delivered Detroit. Dealers are inclined to be cocky and some plan to hold inventories to yearend for tax purposes. Meanwhile rejections are being stepped up by steel mills, striking many as strange in view of their alleged critical need for material. Some rejections are justified, particularly in turnings which on occasion are "loaded" with grindings, galvanized and other unacceptable material. However, wonderment is expressed over the fact that a car which may be rejected by one mill often can be transferred to another mill and unloaded with no complaints. The inference of course is a planned stepping-up of rejections by scrap users. Cast grades are sentimentally a shade weaker.

Cincinnati — Quotations of steelmaking grades of scrap were lowered $1.50 last week as a gesture to the price stabilization movement, but the new figures do not represent actual tonnage transactions. Dealers are busy filling old orders and see no attraction in the lowered mill bids.

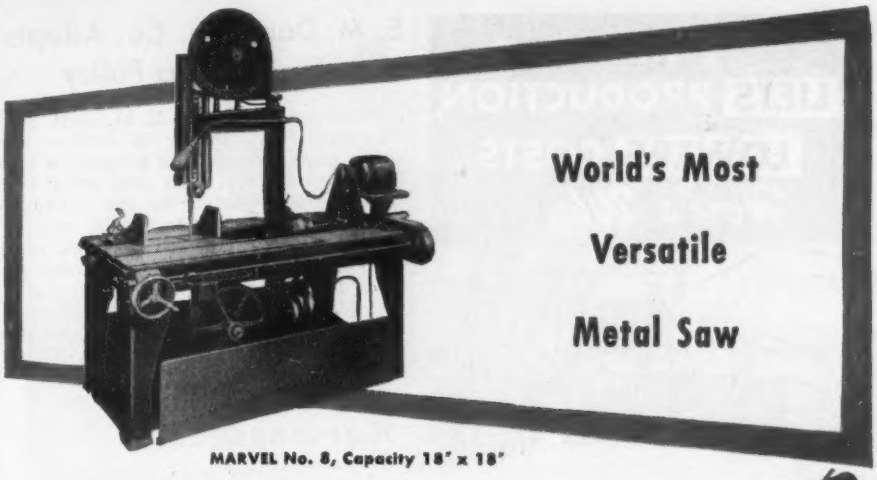
Structural Shapes . . .

Structural Shape Prices, Page 169

Philadelphia — Demand for structural shapes continues spotty. A fair amount of work is being estimated, but orders remain light. An outstanding award involves 1800 tons for a plant addition for the Armstrong Cork Co. while a leading inquiry involves 425 tons for a plant extension for the General Aniline & Film Corp., Grasselli, N. J. Consumers and distributors of shapes report a better flow of tonnage from the mills, although this improvement likely will be checked soon since one eastern unit is scheduled to go down for repairs in December. Consumer quotas for first quarter reflect some betterment in the position of most producers. However, there is little question that demand will be more pressing in that period as the spring building approaches.

New York — Public works appear to dominate the local structural steel market with a state bridge at Rosalyn, L. I., involving about 4000 tons, outstanding. Bids are scheduled for Nov. 12. Another sizable job involves 880 tons of shapes and 1000 tons of reinforcing steel and piling for the Downsville dam, tunnel and cut-off wall for the New York City Board of Water Supply, on which bids have been closed. Several additional school projects also are before the trade.

Birmingham — Shapes are being inquired for in rather consistent and regular order, but a great deal of the tonnage does not get beyond the inquiry stage. Prospective shape tonnage is large if and when conditions in the construction industry clear up. Some spotted tonnage, mostly in relatively small projects, is currently reported.



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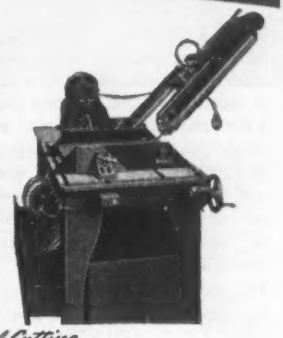

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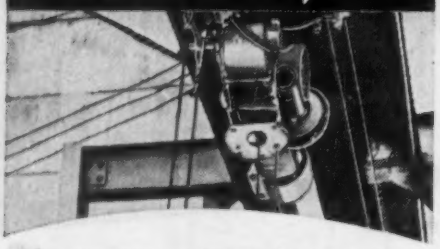

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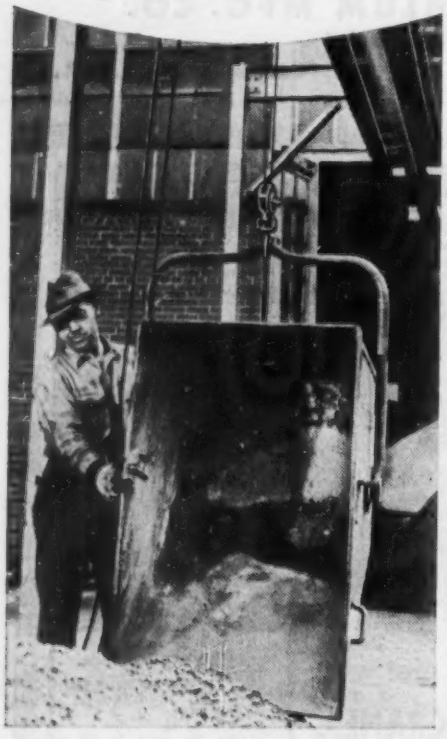

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E. M. Dart Mfg. Co. Adopts New Firm Pricing Policy

Providence, R. I. — E. M. Dart Mfg. Co., this city, maker of unions and union pipe fittings, has adopted a new firm price policy. On and after Oct. 1, all prices quoted by the company are on a firm price basis, subject to acceptance within 15 days from date of quotation. All products shipped on orders dated Oct. 1 and thereafter are being billed at prices in effect on date order was accepted or prices prevailing at time of shipment, whichever is the lower.

Warehouse...

Warehouse Prices, Page 171

Pittsburgh — Most distributors continue to fall far short of meeting their customers' urgent steel requirements, notably for shapes, plates, nails, standard pipe, sheets and strip. Relatively good inventory positions are noted for stainless steel items, alloy bars and tubing, and cold-finished bars. While the mills' allotments for warehouse accounts have been reduced this quarter, the difference is expected to be made up with at least partial shipment of carryover tonnage.

Philadelphia — Jobbers here report active business, although doubt is expressed that the daily average will be quite as high as last month, when bookings were the heaviest for the year to date for some distributors. Except for shapes, it appears doubtful that mill deliveries to warehouses will be as heavy, especially in the flat-rolled items.

Chicago — Under extreme pressure from customers for flat-rolled steel products, warehouses are finding more and more users are turning to other materials as substitutes. For many uses, aluminum sheets are being substituted, and volume of such business is increasing. Tightness is still severe in small carbon bars and bar shapes, for light structurals, plates and wire. Alloys, cold drawn and stainless remain relatively easy.

Cincinnati — Fair shipments from mills are enabling warehouses to maintain sales at recent levels. However, these may be at the expense of December business because full effect of quota cuts is anticipated soon. Demand for items in critical supply shows no sign of slackening with normal mill customers ever pressing for larger tonnages.

Seattle — Wholesale jobbers in this area are compiling new price lists following increase of rail and water freights. The new prices will average 15 cents per hundredweight on items coming from eastern mills and negotiations are in progress on angles, I-beams, channels and other items produced on the Coast. An unexplained rise in demand for all out-of-stock items in the last ten days is reported.

Bolts, Nuts...

Bolt, Nut, Rivet Prices, Page 169

Pittsburgh — Fastener production schedules were at relatively high levels in October although inadequate steel supply, particularly cold-heading stocks, continued to prevent attainment of projected production goals. On the basis of present mill delivery promises, no improvement in this situation is indicated over the remainder of this year. Most sellers have made little headway against large order backlogs, while pressure for prompt shipments has shown no signs of abating. Deliveries of nuts and bolts are extended six to eight months for sizes under 1/4-inch.

Semifinished Steel...

Semifinished Prices, Page 168

Pittsburgh — Indicative of the extreme tight supply situation in semifinished items, sales of rerolling carbon ingots at over $90 per ton are reported in the trade. However, bulk of this tonnage is said to be moving within price range of $80 to $85, the higher prices developing out of electric furnace deals. The same conditions prevail for sheet bars with sales reported in the $85 to $90 range. The Apollo Steel interests are now obtaining their semifinished steel requirements under an intercompany arrangement with Phoenix Iron Co., while similar arrangements have been established by Kaiser interests with Portsmouth Steel Corp. One producer is reported to be selling up to 8000 tons of rerolling carbon ingots monthly at around $80.

Rails, Cars...

Track Material Prices, Page 169

Philadelphia — Pennsylvania railroad will renovate 13,400 freight cars at its shops during the next six months as a continuation of its large-scale freight car repair program. The program involves principally hoppers, although some box cars and gondolas will be included. Contingent upon availability of materials and with no interruptions to production, the program calls for 2100 cars in November, 2300 each in December and January, 2000 in February, 2400 in March and 2300 in April.

Seattle — Great Northern Railway has announced a $7,600,000 program of improvements and plans for additional rolling stock. Directors have approved construction of 500 steel-sheathed box cars and purchase of 200 gondolas.

Three Firms To Get Bulk Of Brooke Iron Production

Birdsboro, Pa.—Eastern foundries will be further pinched for pig iron as the result of a five-year contract negotiated by E. & G. Brooke Iron Co., this city, with Lukens Steel Co., Coatesville, Pa., Worth Steel Co., Claymont, Del., and Warren Foundry & Pipe Corp., New York. These three companies will get about ninety per cent of output, averaging 11,000 to 13,000 tons monthly. In fact, Brooke will care for only low phos iron requirements of the Birdsboro Steel Foundry & Machine Co. and the foundry iron needs of a few additional foundries. The Lukens, Worth and Warren companies also have agreed to buy any shares of Brooke stock offered prior to 3 p. m. Dec. 1 at $16. Brooke has been quoting basic iron at $40 a ton since July 1.

Iron Ore . . .

Iron Ore Prices, Page 170

Cleveland — Shipments of Lake Superior iron ore dropped during the week ended Nov. 3 to only 2,042,650 tons, the smallest movement since the first week in May, compared with 2,236,178 tons for the preceding week and 2,074,074 for the like week a year ago, according to the Lake Superior Iron Ore Association, this city. Of the total movement in the Nov. 3 week, 1,991,903 tons were from United States ports, or an average daily loading of 284,557 tons compared with an average of 310,892 tons for the preceding week.

The season's cumulative total to Nov. 3 is 72,214,177 tons compared with 53,108,709 for the like 1946 period. United States ports accounted for 70,644,388 tons this season, or an increase of 18,706,136 tons over the amount a year ago.

During October, shipments totaled 9,784,550 tons, an increase of 575,246 tons, or 6.25 per cent, over the October, 1946, total. Details of the shipments in October and in the first ten months of the year follow:

Port	October, 1947	October, 1946
Escanaba	515,280	493,206
Marquette	709,012	418,027
Ashland	593,120	628,193
Superior	2,960,083	3,176,649
Duluth	2,469,276	2,299,671
Two Harbors	2,249,582	1,985,198
Total U. S.	9,496,353	9,000,944
Michipicoten	69,943	49,311
Port Arthur	218,254	159,049
Total Canada	288,197	208,360
Grand Total	9,784,550	9,209,304

Port	To Nov. 1, 1947	To Nov. 1, 1946
Escanaba	3,708,239	2,660,588
Marquette	4,272,288	2,147,218
Ashland	4,811,750	3,243,615
Superior	24,080,025	16,908,226
Duluth	17,546,259	14,158,551
Two Harbors	15,505,292	12,210,133
Total U. S.	69,923,853	51,328,331
Michipicoten	386,168	399,262
Port Arthur	1,174,090	741,345
Total Canada	1,560,258	1,140,607
Grand Total	71,484,111	52,468,938

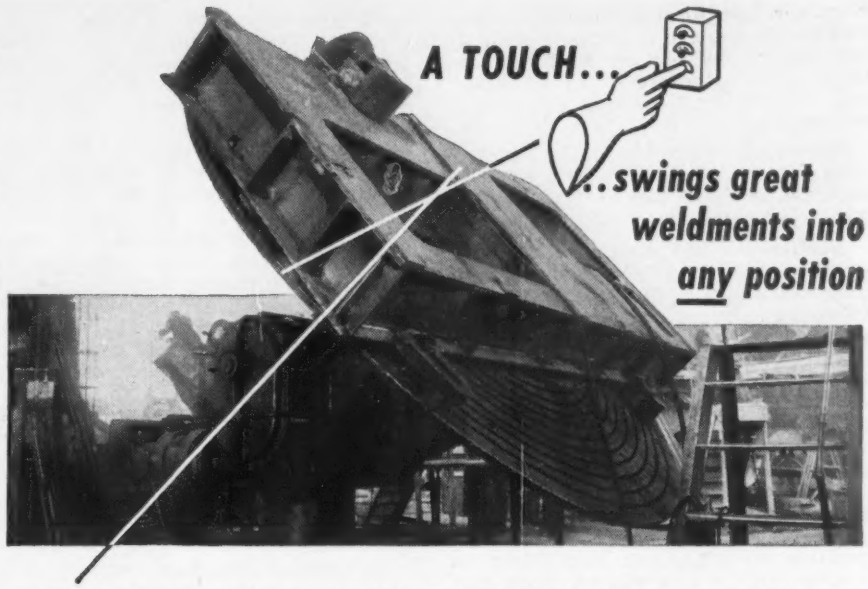
Pig Iron . . .

Pig Iron Prices, Page 170

New York — Pig iron supply is tightening further, with the movement to district consumers this month expected to be the lightest so far this year. Most foundries are operating on a restricted basis, with some down for periods of several days at a time. Consumer inventories are small, despite efforts to conserve by melting on a part-time basis. One large upstate consumer has only three days supply on hand.

This situation, however, is causing little easing in pressure for foundry coke, which for the time being is in better supply due to restricted pig iron production. Consumers are taking the opportunity to build up stocks, especially with the winter season approaching.

The new Daingerfield, Tex., furnace of the Lone Star Steel Co. has finally gone into blast, but the effect should not be reflected in direct shipments to the North for some time, as the producer is committed to supply his first 85,000 tons to southern foun-



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dries for housing requirements. The furnace is expected to average around 400 tons a day for the first two or three weeks, working up to its capacity of 1000 tons or over as rapidly as possible.

According to word here, the Pueblo, Col., furnace of the Colorado Fuel & Iron Co. is down for 10 days to two weeks for patching.

Boston — While some shops have experienced a slight letdown in volume, demand for pig iron is in excess of supply. Little outside iron is expected to be shipped to this territory during the balance of this year, and the 15,000 tons a month from the Everett furnace will be the backbone of supply. Few of the furnaces which will be down in the next month ship to this area, normally, but this loss of tonnage will be felt indirectly. Basic consumers are operating with low inventories and will be in no position to withstand any tie-up in transportation this winter. Two mechanical melting units, going into production early next year, will increase substantially melt capacity at two plants, Crompton & Knowles Loom Works, Worcester, and the Grinnell foundry, Providence.

Philadelphia — The squeeze in pig iron is increasing. Consumer inventories are still shrinking and the movement of iron from the furnaces is lighter than it was a month ago. Consumers see no relief over the remainder of the year, and relatively little improvement for some time thereafter. Both basic and foundry iron consumers are operating on a hand-to-mouth basis. Some foundries are down completely for limited periods, taking occasion in certain instances to reline cupolas and install necessary new equipment, rather than doing the work over weekends. Indications are that government subsidies on iron for essential housing requirements will be extended through June of next year.

Chicago — Forty-one of 42 blast furnaces in this district continue in operation but insofar as stacks owned by steelmakers are concerned hot metal gets first call. This limits the amount of iron which is available to foundries, forcing the latter to gage their melts in keeping with iron shipments. Distributors of iron are under constant pressure from foundries for more iron and faster shipments, thus the problem of allocating available tonnage is a neat one. Supply of metallurgical coke is adequate to match pig iron.

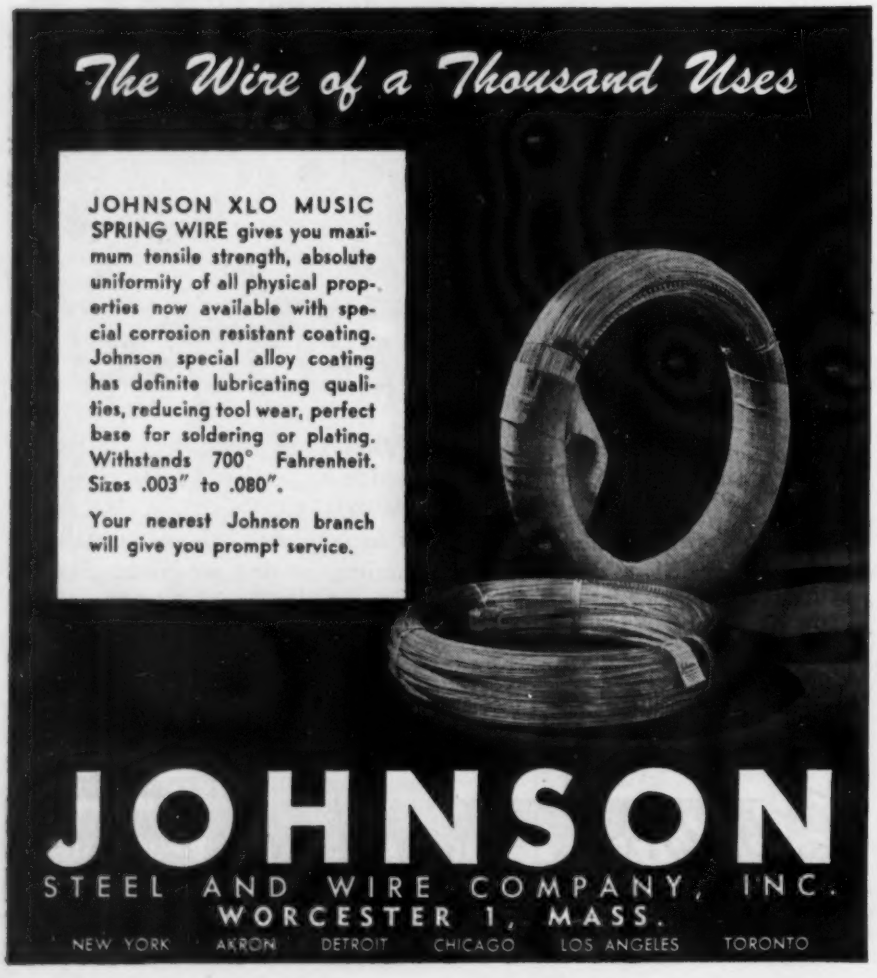
Cincinnati—Shortage of pig iron was aggravated recently by transportation delays, blamed on freight car breakdowns. Such incidents mean interruption in the melt, as district foundries are without reserves. Tonnage alloted by both Northern and Southern furnaces is far below needs.

Buffalo — Merchant pig iron continues under strict allocation and the shortage became more pronounced last week as the promise of increased production failed to materialize. Holidays and hot weather in July and August gave the impression that foundry business was receding, but uninterrupted operations in the last month changed the picture and tightened up supplies. Suspension of the blast furnace at Swedeland, Pa., made additional coke available in eastern New York temporarily, but in the western part of the state there has been no improvement. One of the leading producers of electric furnace silvery iron announced renewal of the October price for November. Blast furnace grades likewise were unchanged.

Birmingham — The district's pig iron supply remains woefully short of normal requirements. Industrial development sources here say they are virtually stymied in their program since there is no iron to offer newcomers. The same situation, to possibly a lesser degree, obtains in steel.

St. Louis—Pig Iron production at Koppers, which supplies the majority of melters in this district, has remained at the 1000 ton level for several months with the result local users are in no distress, although the supplies are limited. Output reached the 1016 ton level last month, equally divided between basic and foundry iron. WAA sale of the Koppers furnaces has left melters here confident their allocations will not be changed. Ore stockpiles are adequate but the furnaces are running hand-to-mouth on coke, with no reserves. Koppers consumes 1000 tons daily and normally keeps 4000 to 5000 tons stockpiled. Pig iron demand is extremely high and melters have difficulty increasing shipments from outside points. It is estimated local pig consumption could be tripled were it available.

Seattle — While foundry activity is declining, plants are unable to obtain sufficient tonnages of cast iron scrap and the industry is having difficulty in holding the price level at $27.50 per gross ton. An increase may be announced shortly. The situation is aggravated by the lack of pig iron, no shipments coming from Utah presently and eastern pig being competitively out of this market.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Canada . . .

Toronto, Ont. — Production of primary iron and steel shapes in Canada for August totaled 234,601 net tons, compared with 228,844 tons in July and only 82,518 tons in August, 1946, when strikes closed two of the major steel producers entirely and cut operations of the other to less than 60 per cent of capacity. During August, output included 233,707 tons of carbon steel shapes and 10,894 tons of alloy steel shapes.

Primary iron and steel shapes shipped for sale in August amounted to 182,324 net tons, including 172,301 tons of carbon shapes and 10,023 tons of alloy steel shapes; in July, shipments amounted to 167,494 tons including 159,285 tons of carbon and 8313 tons of alloy shapes.

In the first eight months of this year, production of primary iron and steel shapes totaled 2,094,652 net tons while shipments for sale amounted to 1,580,603 tons, and delivery for producers interchange, 524,174 tons. This compares with production of 1,661,790 tons, shipments for sale of 1,343,423 tons and producers' interchange of 310,439 tons in the like 1946 period.

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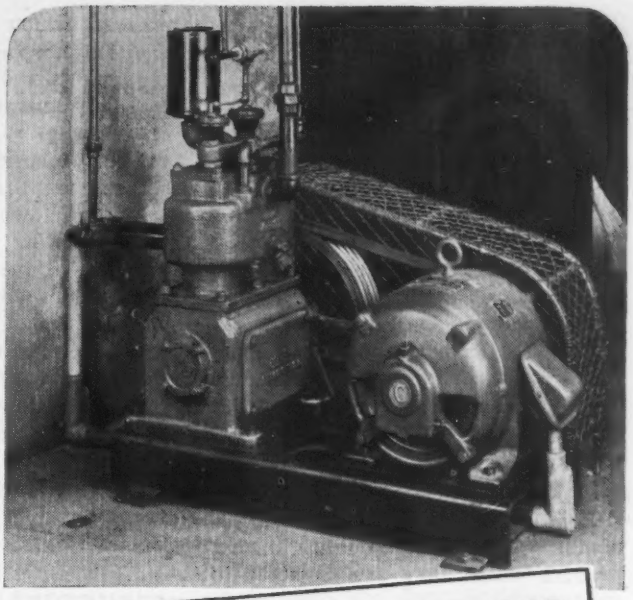

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93 Years of Precision Manufacturing

Contract Tool, Die Shops Find Their Horizons Wider

(*Concluded from Page 79*)

ent, Tool & Plant Maintenance Division, Western Electric Co., Kearney, N. J.

Lively "Give-and-Take" — Representing contract tool shops were Centre W. Holmberg, president, August W. Holmberg & Co. Inc., New York, and H. E. Ehrhardt, president, Norwood Engineering Co., Dayton, O. The "give-and-take" was lively, but entirely friendly and highly constructive.

Mr. Paul urged the tool men to study the jobs from the standpoint of the quantity and quality of the product which they are expected to produce; to give them a tryout, and not to oversell the customer.

Mr. Holmberg suggested that for better understanding between vendor and user of tools, each should visit and study the other's plant. He asked that users not broadcast bids, but limit them to shops of known capabilities. "Don't rush your estimates," he told the tool men. "Don't specify unduly tight limits," he advised the users.

Mr. Allen explained that his company has a toolroom but is depending more and more on help from outside tool shops. He uses experienced tool men in his purchasing department to advise on tool purchases and has contact men to follow through on these outside orders. He urged tool men (1) to pack tools carefully for shipment, (2) not to disregard specified close tolerances, (3) not to substitute steels for those specified—it merits spoilage in future heat treatment, (4) to use more process inspection when making tools, (5) to try out dies in some other shop if press equipment is not available in the toolmaker's own shop, and (6) not to accept work without adequate facilities for carrying it through.

Mr. Ehrhardt mentioned that in a business which involves everything from high speed steel to diamonds, the small size of the average contract tool shop insures intimate supervision of the highly specialized work involved. Sincerity is the keynote to success in this business, he added.

The following national officers were elected for 1947-48 at this NTDMA convention in Philadelphia. President, William R. White Jr., Midwestern Tool Co., Chicago; first vice president, J. J. Kohl, International Tool Co., Dayton, O.; second vice president, John H. Benetz, Bridge Tool & Die Works, Philadelphia; secretary, Centre W. Holmberg, August M. Holmberg & Co. Inc., New York; treasurer, Jerome Stanek, Stanek Tool & Mfg. Co., Milwaukee.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

1800 tons, plant addition, Armstrong Cork Co., Lancaster, Pa., to Lehigh Structural Steel Co., Bethlehem, Pa.

1184 tons, bridge, Spring Green, Wis., for state, to American Bridge Co., Pittsburgh; Industrial Contracting Co., Minneapolis, contractor.

911 tons, bridge, Sec. 34Z-1F, Danville, Vermilion county, Ill., for State Highway Division, to Illinois Steel Bridge Co., Jacksonville, Ill.; bids Sept. 12.

670 tons, school No. 133, Manhattan, N. Y., to Lehigh Structural Steel Co., Allentown, Pa.

600 tons, addition to manufacturing building, International Harvester Co., Indianapolis, to Gage Structural Steel Co., Chicago, for fabrication by Allied Structural Steel Cos.

365 tons, steel joists, Estabrook housing project, Milwaukee, to Bethlehem Steel Co., Bethlehem, Pa.; Schroedel Construction Co., Milwaukee, contractor.

225 tons, service building, Virginia Electric & Power Co., Alexandria, Va., to Virginia Bridge Co. Roanoke, Va.; Stone & Webster Engineering Corp., Boston, contractor-engineer.

225 tons, bridge, Proj. F 028-4(14), Douglas county, Wis., for state, to American Bridge Co., Pittsburgh; Industrial Contracting Co., Minneapolis, contractor.

210 tons, storage building, New York, New Haven & Hartford Railway, New Haven, Conn., to Groisser & Shlager Iron Works, Somerville, Mass.; J. W. Bishop Co., Worcester, Mass., general contractor; Fox Steel Co., New Haven, awarded 42 tons reinforcing bars.

150 tons, Washington state highway bridge, Okanogan county, to Isaacson Iron Works, Seattle; Sather & Sons, Spokane, general contractor, low at $125,246.

150 tons, state bridge, Peabody, Mass., to Bethlehem Steel Co., Bethlehem, Pa.

150 tons, paper mill, Tomahawk Kraft Paper Co., Tomahawk, Wis., to Northeastern Boiler & Welding Co., Green Bay, Wis.

145 tons, state bridge, Blackstone, Mass., to Bethlehem Steel Co., Bethlehem, Pa.; M. & R. Construction Co., Boston, general contractor.

136 tons, bridge, Proj. S049(1), Ozaukee county, Wis., for state, to Worden-Allen Co., Milwaukee; H. B. Janke, contractor; bids Sept. 30.

125 tons, transmission line, Virginia Electric & Power Co., Dunfres, Va., to Bethlehem Steel Co., Bethlehem, Pa.; Stone & Webster Engineering Corp., Boston, engineer-contractor.

110 tons, coaling station and beam spans, Wisconsin and Iowa, for Chicago, Milwaukee, St. Paul & Pacific Railroad, to American Bridge Co., Pittsburgh.

110 tons, power plant addition, Connecticut Power Co., Stamford, Conn., to Berlin Construction Co., Berlin, Conn.; Stone & Webster Engineering Corp., Boston, engineer-contractor.

100 tons, telephone exchange building, Yakima, Wash., to Star Iron Works, Tacoma.

STRUCTURAL STEEL PENDING

4000 tons, state bridge, Rosalyn, L. I.; bids due Nov. 12.

1700 tons, underpass, Dupont Circle underpass, Washington, District of Columbia commissioners; bids Nov. 14.

880 tons, public school No. 3, Brooklyn, N. Y.; bids asked.

880 tons, Downsville dam, tunnel and cut-off wall, New York City Board of Water Supply; bids closed.

850 tons, public school No. 20, Queens, N. Y.

425 tons, plant addition, General Aniline & Film Corp., Grasselli, N. J.

100 tons, state bridge, three-span I-beam over New Haven railroad, Danbury, Conn.; bids Nov. 17, Hartford.

100 tons or more, three transmission towers, Seattle city light, to M. P. Munter, Seattle, general contractor, low $16,485.

Unstated, steel and concrete state span, Bitterroot river, Montana, to W. P. Roscoe Co., Billings, general contractor, low $105,277.

Unstated, ten steel bridges in various Montana counties, total estimate $870,000; bids to state highway commission, Helena, Dec. 10.

Unstated, oil storage and recovery facilities, Spokane, Portland & Seattle Ry., $100,000 project; bids invited.

Unstated, fabricating plant, Chicago Bridge & Iron Co., Salt Lake City, Utah.

Unstated tonnage, steel towers, Davis Dam project, Bureau of Reclamation, Denver; Bethlehem Pacific Coast Steel Corp., low, $438,926, fob San Francisco.

Unstated, public school No. 173, Queens, N. Y.

REINFORCING BARS . . .

REINFORCING BARS PLACED

1000 tons, elevator, mill building, Minneapolis Linseed Oil Co., Minneapolis, to Truscon

Blast Furnace Capacity and Production—Net Tons — SEPTEMBER – 1947

	Number of companies	Annual blast furnace capacity	Production							
			Pig Iron		Ferro manganese and spiegel		Total		Percent of capacity	
			Current month	Year to date	Current Month	Year to date	Current month	Year to date	Current month	Year to date
Distribution by Districts:										
Eastern	11	12,551,280	904,712	8,108,178	33,352	240,659	938,064	8,348,837	91.0	88.9
Pittsburgh-Youngstown	17	25,042,040	1,789,428	16,952,455	18,420	142,773	1,807,848	17,095,228	87.9	91.3
Cleveland-Detroit	6	6,557,500	468,947	4,342,558	-	-	468,947	4,342,558	87.1	88.5
Chicago	7	14,097,710	1,068,885	9,356,791	-	-	1,068,885	9,356,791	92.4	88.7
Southern	8	4,924,670	319,443	2,890,566	8,684	84,836	328,127	2,975,402	81.2	80.8
Western	4	2,536,000	188,749	1,657,481	-	11,297	188,749	1,668,778	90.7	88.0
Total	37	65,709,200	4,740,164	43,308,029	60,456	479,565	4,800,620	43,787,594	89.0	89.1

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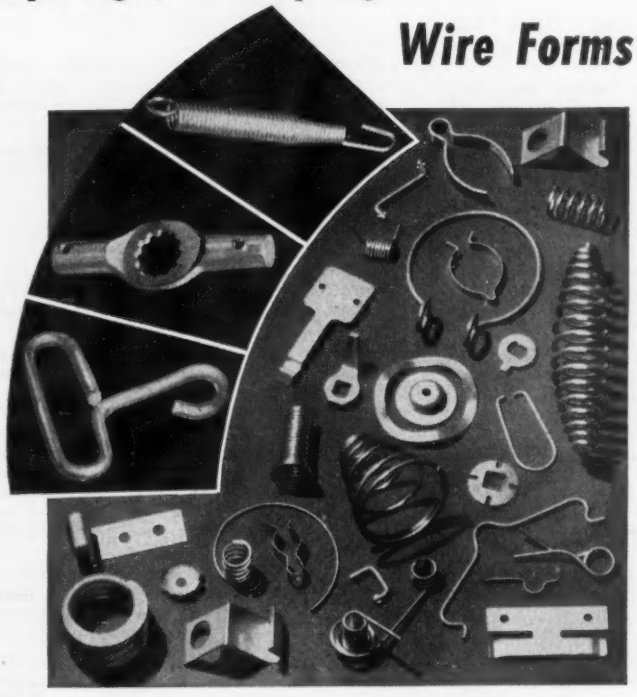

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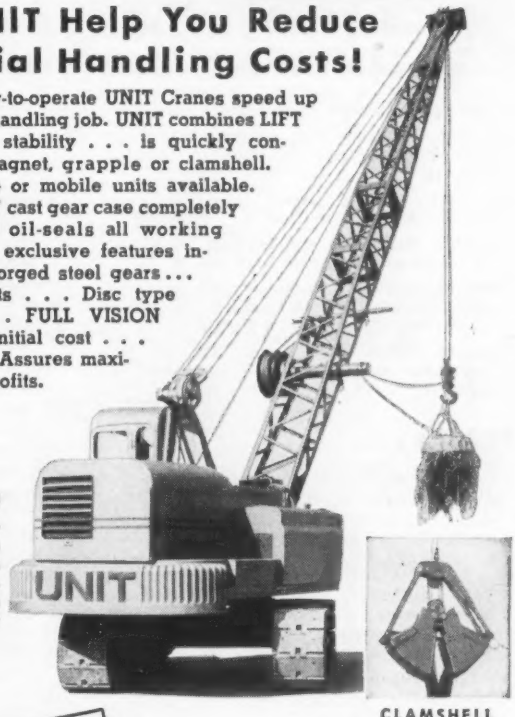

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Steel Co., Youngstown, O.; Feeles Construction Co., Minneapolis, contractor.

770 tons, building, Western Electric Co., Minneapolis, to Bethlehem Steel Co., Bethlehem, Pa.; C. F. Haglin & Sons Co., Minneapolis, contractor.

500 tons, S. L. Savidge Co. automobile warehouse, Seattle, to Bethlehem Pacific Coast Steel Co., Seattle; Kuney-Johnson Co. general contractor.

257 tons, building, Northern Indiana Children's Hospital, South Bend, Ind., to Ceco Steel Products Corp., Cicero, Ill.; Peter Schumacher & Sons, Mishawaka, Ind., contractor.

180 tons, plant addition, Veeder Root Inc., Hartford, Conn., to Scherer Steel Co., Hartford; H. Wales Lines Co., Meriden, Conn., general contractor.

150 tons, miscellaneous commercial projects near Seattle, to Bethlehem Pacific Coast Steel Co., Seattle.

150 tons, city bridge, Renton, Wash., to Bethlehem Pacific Coast Steel Co., Seattle.

100 tons, Washington state highway bridge, to Bethlehem Pacific Coast Steel Co., Seattle.

REINFORCING BARS PENDING

2800 tons, bridge superstructure, Caney Fork river on Tennessee highway No. 56, bids to U. S. Engineer, Nashville; Nashville Bridge Co., low, $841,172.20.

1845 tons, estimated, Sligo bridge superstructure, Caney Fork river on Tennessee highway No. 26, bid to U. S. Engineer, Nashville; Bethlehem Steel Co., Bethlehem, Pa., low, $553,658.78.

1000 tons, reinforcing steel and piling, Downsville dam, tunnel and cut-off wall, New York City Board of Water Supply; bids closed.

925 tons, sewer, S. Omaha, Nebr.; bids taken Sept. 2 rejected.

485 tons, outlet works, Benbrook dam and reservoir, Trinity River basin, Texas; bids Nov. 21, U. S. Engineer, Galveston; work also takes 55 tons, 30-inch steel pipe.

180 tons, also 50 tons shapes, Washington state highway projects; bids to Olympia, Nov. 18.

165 tons, building, Mercy hospital, Benton Harbor, Mich.; bids Nov. 7.

Unstated, $1,200,000 art building, University of Washington, Seattle; bids Dec. 2.

Unstated, $200,000 Puget Sound News Co. plant, Seattle; $200,000 general contract to Mowat Construction Co., Seattle.

Unstated, junior high school, Seattle; Nels Mortensen & Co., Seattle, low base bid $953,171.

PLATES . . .

PLATES PLACED

155 tons, tanks, Gulf Oil Corp., East Providence, R. I., to Chicago Bridge & Iron Co., Chicago.

PLATES PENDING

3630 tons, McNary dam cofferdam, Columbia river; general contract by U. S. Engineer to G. F. Atkinson Co., San Francisco, at $1,166,610.

Unstated, repairs to Cedar river water supply line, Seattle; bids in.

RAILS, CARS . . .

RAILROAD CARS PLACED

Chicago Great Western, 10 seventy-ton gondolas, to Pressed Steel Car Co., Pittsburgh.

Western Maryland, 1000 fifty-ton hopper cars, to Bethlehem Steel Co., Bethlehem, Pa.

RAILROAD CARS PENDING

Great Northern, 200 gondolas; bids pending. Company will construct 500 steel-sheathed box cars.

LOCOMOTIVES PLACED

Lehigh Valley, 7 diesel locomotives, to American Locomotive Co., New York.

Norfolk & Western, ten 2-8-8-2 type steam locomotives, to own shops, Roanoke, Va.

CONSTRUCTION AND ENTERPRISE

NORTH CAROLINA

GREENSBORO, N. C.—Modern Metal Products Co. has been incorporated by Harvey J. Smith and associates with a capital of $100,000 to manufacture metal products.

OREGON

PORTLAND, OREG. — Continental Can Co., 100 E. 42nd St., New York, has awarded a $1 million contract to L. H. Hoffman, 715 S. W. Columbia St., for construction of a factory.

PENNSYLVANIA

ELLWOOD CITY, PA.—United Natural Gas Co., Oil City, Pa., has awarded a contract to Chemical Plants Division of Blaw-Knox Co., Pittsburgh, for the construction of a compressor station near here.

HAYS, Pa.—American Brake Shoe Co., Southern Wheel Division, Mohawk, N. Y., will spend $225,000 on plant alterations and additions.

LANCASTER, PA.—Hamilton Watch Co. plans to spend $100,000 in altering its manufacturing buildings. Walter F. Breen, c/o owner, is maintenance superintendent.

MCKEES ROCKS, PA.—Gordon Lubricating Co., Carnegie, has awarded a $125,000 contract to H. H. & J. M. Boor, First and Pennsylvania R. R., Carnegie, for construction of a 1-story oil and grease plant.

PITTSBURGH—Automotive Ignition Co., 4919 Baum Blvd., has awarded a $75,000 contract to Uhl Construction Co., 6001 Butler St., for erection of a 1-story plant.

TENNESSEE

MEMPHIS, TENN.—Chuck Dutton Co., 1107 Union St., has awarded a $100,000 contract to Tri-State Construction Co., Manhattan Bank Bldg., for erection of a truck shop building and warehouse.

TEXAS

HEARNE, TEX.—Texas Pipe Line Co., Texas Bldg., Houston, has awarded a $135,000 contract to Brown Lane Co., Borger, for construction of a pumping station here.

HOUSTON, TEX.—Hargis Motor Co., 1317 McKinney St., will let a $190,000 contract for a motor repair shop and parts storage building.

HOUSTON, TEX.—Houston Natural Gas Corp., Petroleum Bldg., will spend $8 million for the construction of eight gas plant buildings. Architect is B. P. Briscoe, 3901 Travis St.

HOUSTON, TEX.—Cook Paint & Varnish Co., 1816 Main St., has awarded a $340,000 contract to J. A. Jones Construction Co., 117 E. 11th St., for erection of a 3-story factory and warehouse.

MCALLEN, TEX. — Transcontinental Gas Pipe Line Co., c/o Claude Williams, president, 107 W. Fourth St., Austin, plans to build an 1800-mile, six-in. gas pipeline originating here and crossing Louisiana, Mississippi, Alabama, Georgia, North Carolina, Virginia, connecting with a lateral line into Philadelphia and terminating at 152nd St. and Hudson river in New York. Cost will be $155 million. Consulting engineer is Fish Engineering Co., M. & M. Bldg., Houston.

PETTUS, TEX.—Anderson-Pritchard Oil Co. and associated companies, Milan Bldg., San Antonio, has awarded a $5,700,000 contract to Jones & Laughlin Supply Co., 108 N. Trenton St., Tulsa, Okla., for construction of a cycling plant seven miles northeast of here.

SAN ANTONIO, TEX.—Sinclair Oil & Refining Co., Gulf Bldg., Houston, has awarded a $775,000 contract to Whitaker Pipe Line Co., Dan Waggoner Bldg., Ft. Worth, for construction of 85 miles of oil pipeline between here and Luling.

WICHITA FALLS, TEX.—Texas Co., Texas Bldg., Houston, plans to build an oil pipeline from here to Midland, a distance of 253 miles. Cost will be $10,500,000. Engineer is L. F. Shearer, c/o owner.

WINNSBORO, TEX.—Winnsboro Refining Co. has awarded a $200,000 contract to Mid-Continent Engineering Co. Inc., 25½ Highland Park Shopping Village, Dallas, for design and construction of a crude-oil refining plant.

VIRGINIA

NEWPORT NEWS, VA.—Asheville Mica Co. has let a $153,500 contract to Virginia Engineering Co. Inc. for construction of the first two units of a proposed expansion program.

WISCONSIN

BURLINGTON, WIS.—Coppers Inc., 2318 60th St., Kenosha, has awarded a $55,000 contract to Peter Ploskee, Lake Shore Rd., Kenosha, for construction of a 1-story factory.

CANADA

KELOWNA, B. C.—McGavins Ltd., 106 W. Broadway, Vancouver, has awarded a $55,000 contract to G. L. Dore for construction of a plant here.

WINNIPEG, MAN.—Canadian National Railways, J. L. Charles, chief engineer, has awarded a $93,000 contract to Beaver Construction Co., 1066 Arlington St., for the superstructure of a central heating plant.

SYDNEY, N. S.—Dominion Steel & Coal Corp. Ltd., Canada Cement Bldg., Montreal, Que., has awarded a $4 million contract to Koppers Co., Koppers Bldg., Pittsburgh, for a steel mill expansion program, including installing 43 new coke ovens.

BRANTFORD, ONT.—Canadian Durex Abrasives Ltd., Canal Rd., has awarded a $1 million contract to Cramar Construction Co. Ltd., 448 Colborne St., for erection of a plant addition.

CHATHAM, ONT.—Hinde & Dauch Paper Co. of Canada Ltd., L. F. Winchell, general manager, 43 Hanna Ave., Toronto, plans to build a $1 million plant and office here. Architect is R. M. Cook, 43 Hanna Ave., Toronto.

TIMMONS, ONT.—Apollo Porcupine Mines Ltd., 45 Richmond St., Toronto, plans to spend $160,000 for rehabilitation of mining property here.

TORONTO, ONT.—Truck & Tractor Equipment Co. Ltd., 34 Noble St., will build a $100,000 factory.

TORONTO, ONT.—Parke Davis & Co. Ltd., 2301 Sandwich St. E., Windsor, will build a $500,000 laboratory on Fleet St. here.

TORONTO, ONT.—Atlas Asbestos Co. Ltd., 110 McGill St., Montreal, will build a $2 million plant at Browns Line and Horner Ave.

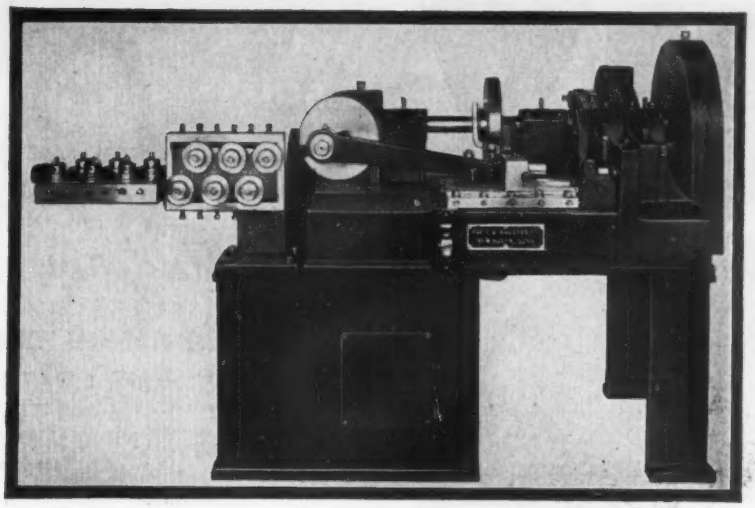
TORONTO, ONT.—Tide Water Oil Co. of Canada Ltd., 201 Weston Rd., has awarded a $100,000 contract to Chestnut-McGregor Ltd., 96 Bloor St. W., for construction of a plant and office wing.

TORONTO, ONT.—Firth Brown Steel Ltd., 73 Sumach St., has awarded a $55,000 contract to T. Michie, 500 King St. W., for construction of a 1- and 2-story warehouse and office. Architect is A. G. Facey, 991 Bay St.

WALLACEBURG, ONT. — National Pressure Cooker Co. of Canada, A. St. Clair Gordon, president, plans to build a $150,000 factory addition.

WELLAND, ONT.—Joseph Stokes Rubber Co. Ltd., Bernard St., has awarded a $150,000 contract to Robertson Construction & Engineering Co. Ltd., 512 Clifton Ave., Niagara Falls, for erection of a plant addition.

EAST MONTREAL, QUE.—British American Oil Co. Ltd., 856 Sun Life Bldg., has awarded a $15 million contract to Canadian Kellogg Co. Ltd., 34 Adelaide St. W., Toronto, Ont., for construction of a fluid catalyst plant at a refinery at Broadway and Sherbrooke Sts.



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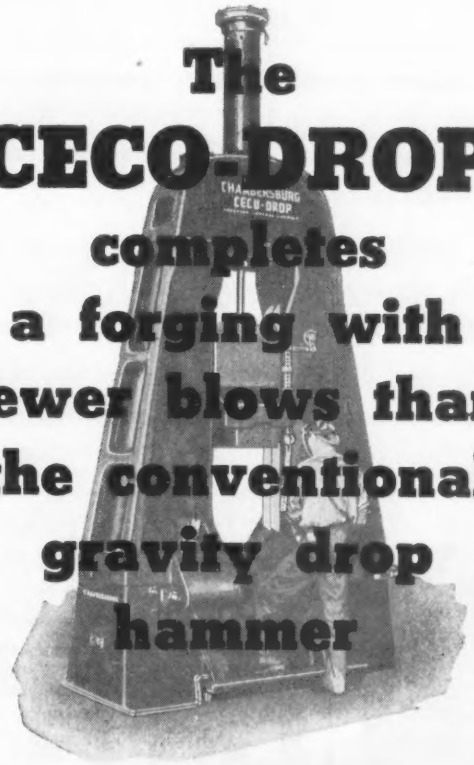

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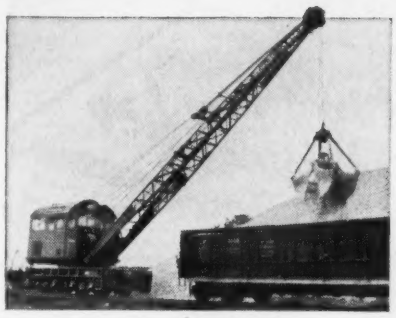

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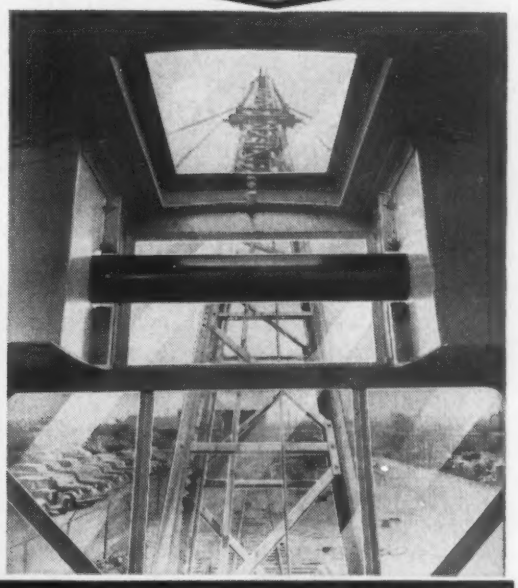

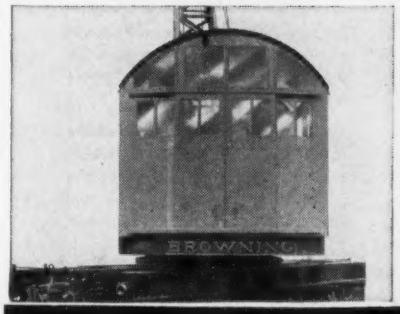

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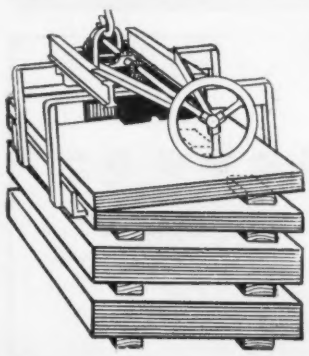

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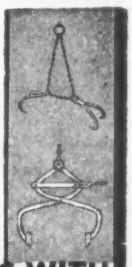

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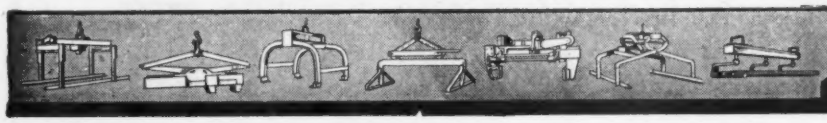

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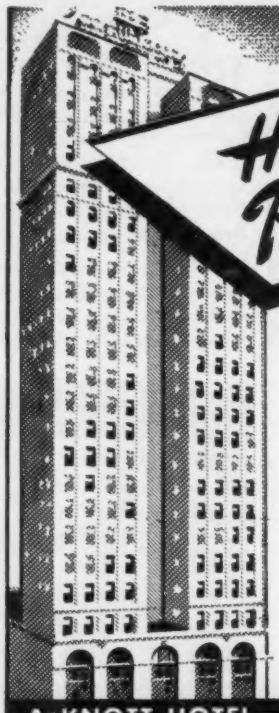

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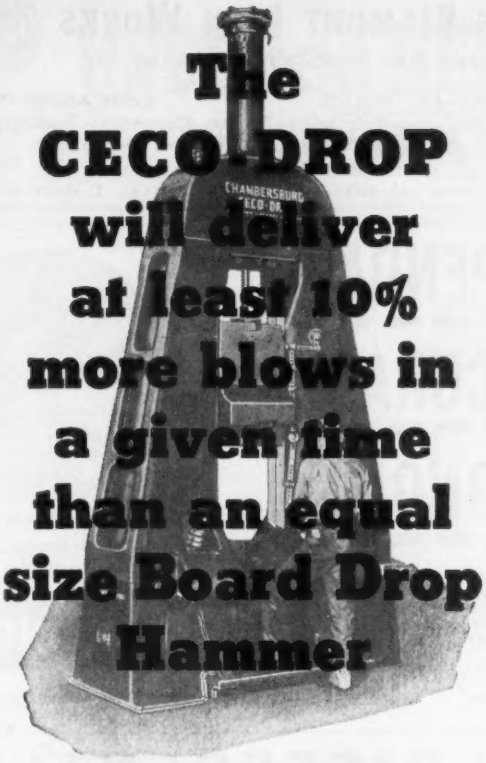

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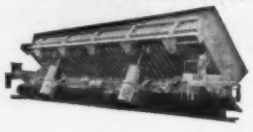

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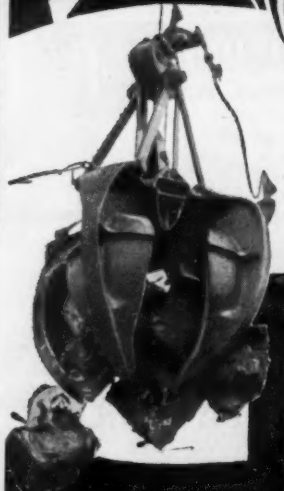

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As the white outline indicates, a standard unit of much greater frame size would be required to do the work of Speedaire.

SPEEDAIRE made it possible

THE layout of this paper box plant allows little clearance for the Wood Screen drive. As this photo shows, motor and speed reducer are mounted on a short, narrow ledge. There is not enough room for a standard drive. Only a compact, powerful Speedaire would go in the limited space available.

Speedaire not only saved space; it saved weight and saved money. A standard worm-gear unit to handle the load would have cost 19% more, weighed 30% more and required 61.4% more space.

Speedaire is Cleveland's new fan-cooled worm-gear speed reducer. Because it is fan-cooled, Speedaire will do more work—will deliver up to *double the horsepower* of standard worm units of equal frame size, at usual motor speeds. It can be installed economically on many applications where other types have been used heretofore—giving you the advantage of a compact right-angle drive. Speedaire gives the same long, trouble-free service characteristic of all Clevelands.

For full description, send for Catalog 300. The Cleveland Worm & Gear Co., 3270 East 80th St., Cleveland 4, Ohio.

Affiliate: The Farval Corporation, Centralized Systems of Lubrication. In Canada: Peacock Brothers Limited.

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Speed Reducers

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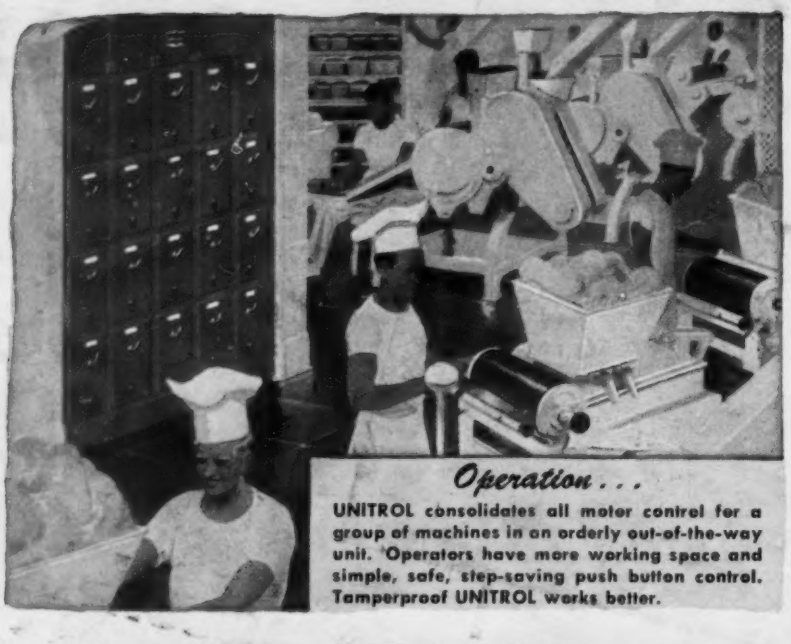

Operation . . .

UNITROL consolidates all motor control for a group of machines in an orderly out-of-the-way unit. Operators have more working space and simple, safe, step-saving push button control. Tamperproof UNITROL works better.

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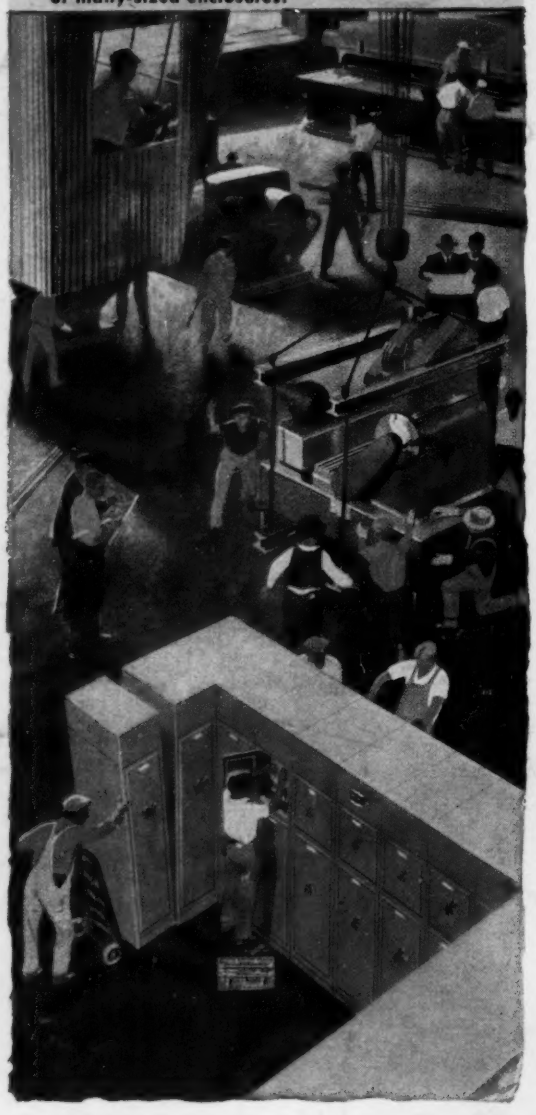
UNITROL simplifies the entire problem of planning and installing motor control equipment. No extra building construction, no special wall or floor preparation, no tedious, costly mounting of many-sized enclosures.



Maintenance . . .

UNITROL's close grouping of control equipment, usually widely scattered throughout a plant, makes inspection more convenient, safer, more certain of regular attention.

UNITROL solves long-standing problems from the very moment it is first considered until the last day it is in service. In the beginning, it simplifies the entire problem of planning any required installation of motor control equipment. Its dimensions are known and its layout made part of the floor plans. Its cost, too, can be estimated accurately. Next, UNITROL saves time and expense in installation. No special wall or floor preparation is required; no tedious, costly mounting and wiring of many-sized enclosures. Then, in operation, UNITROL consolidates motor control to provide more space for machine operators and for materials handling; simpler, safer, tamperproof push button control. And finally, UNITROL simplifies the maintenance attention which any equipment as important as motor control must have. The close grouping of controls in UNITROL makes inspection more convenient, safer, more certain of regular observance. When you next need motor control, for a single machine, a group of machines, or an entire plant, insist on UNITROL. Write today for your copy of the UNITROL book. CUTLER-HAMMER, Inc. 1211 St. Paul Ave., Milwaukee 1, Wis. *Associate:* Canadian Cutler-Hammer, Ltd., Toronto.

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C-H